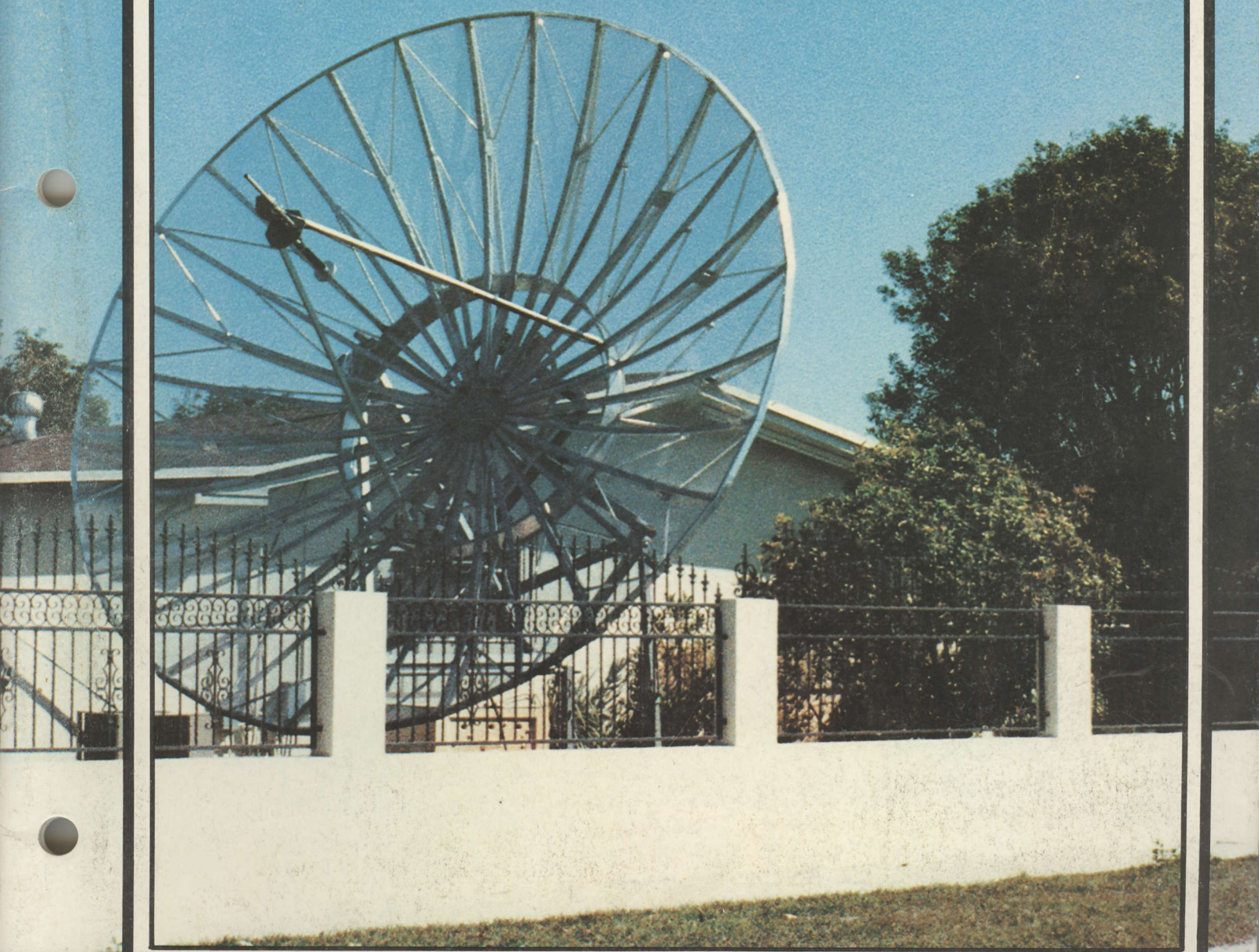


COOP'S
SATELLITE
DIGEST



APRIL 1981

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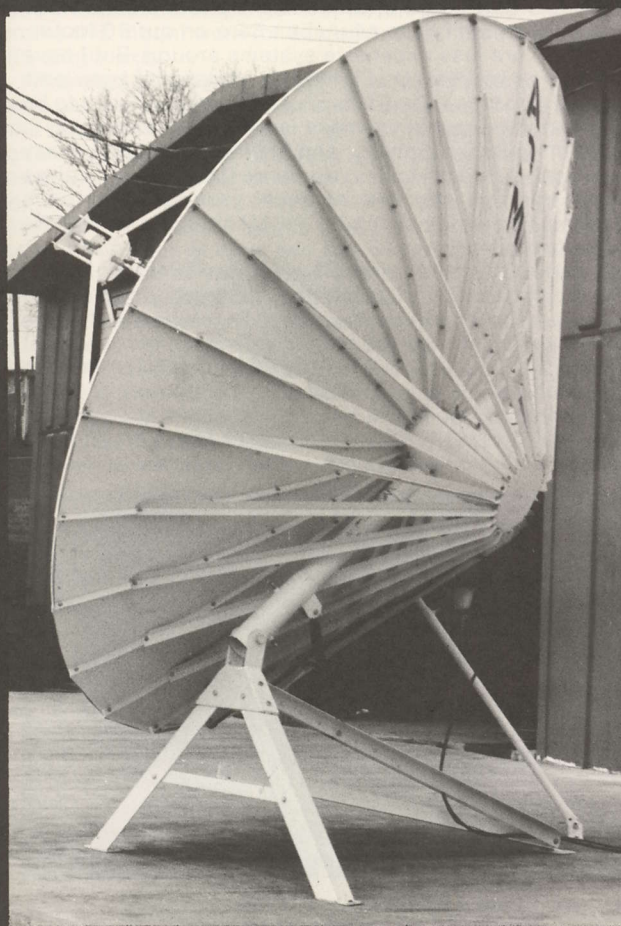
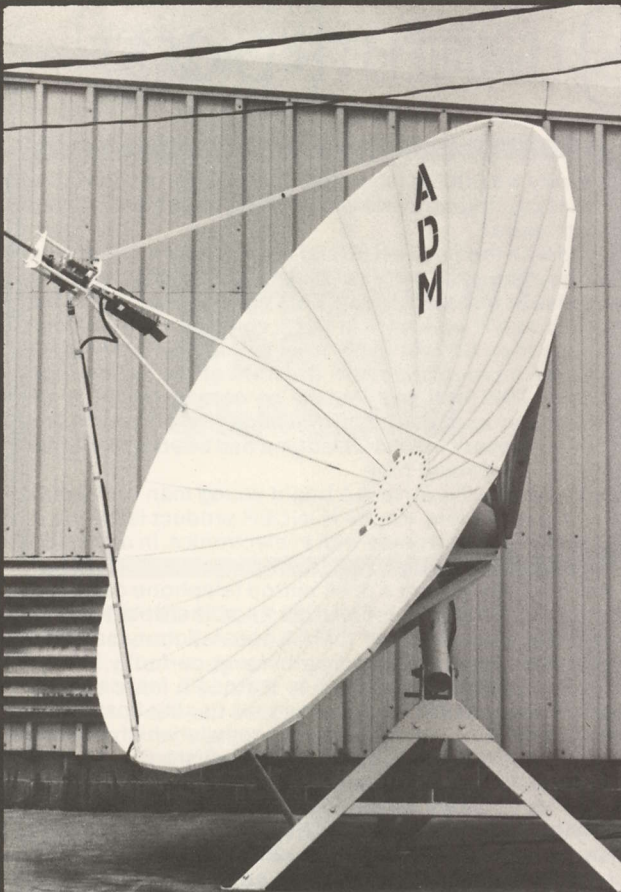
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COOP'S COMMENT ON TECHNOLOGY

DOING IT RIGHT

Returning to Oklahoma on March 17th to put together this issue of the **Digest** Rick Schneringer was doing a 'data-dump' on me in the 50 minute ride from the airport. As we pulled over the last hill with the Arcadia antenna farm on the horizon he said, as an aside, "**There is something new in the yard**". I innocently asked what it might be just as we topped the last ridge.

There square in front of the house, right where I never could get grass to grow something new had been planted; a ten foot diameter **SATFINDER** dish. The site is perhaps 75 feet from the world's first private (licensed) terminal; the 20 foot monster we installed more than four years ago. Rick began bubbling about how wonderful it was to have a dish that tracked 11 satellites at the push of a keyboard entry command. As we both bounded out of the car David MacZura, the young man who developed this unique system came out of the house to greet us. David knew I was going to be in town and he was on hand to show me how it worked.

Rick bought this dish for himself. The old 20 footer **moves** all right, but 'with difficulty'. You don't go out and chase around the sky with it. I had visited with David in Houston where he first showed his automatic tracking system and wrote about it in the January **CSD**. I was impressed then. I am even more impressed now.

MacZura started out by attending the Miami SPTS. He went home, to Tulsa, determined to be an installing dealer of terminals. After a number of false starts with various suppliers he decided nobody really had their act together in the antenna department so he set out to design one he could manufacture and sell (with receivers and LNAs he buys as a dealer) in the mid-west. He now has perhaps 75 installations in and operating. **They are not cheap installations;** starting at \$9,000 and going up to \$16,000. Most of those sold were for the top dollar.

Why, in a day and time when you can piece together the bits and parts for a home terminal for say \$2500 would anyone go

out and pay \$9,000 or (shudder) \$16,000 for an **installed** terminal. Is pouring concrete and hooking up some wire worth that much extra?

I played with the **SATFINDER** for several hours. Remember **this** old boy has seen more satellite television than probably anyone else in the world today. **This** old boy first proved that 10 foot dishes will work back in 1978; coincidentally on a pipe mount less than 60 feet away from where the **SATFINDER** now sits like a proud statute in the front of the Schneringer household. **This old boy** had to be **torn away** from the **SATFINDER** hours later and **forced back to work** on the April **CSD** because every hour in Oklahoma had been apportioned before I hit the ground here.

I like David MacZura. He is a bright young man with a solid head on his shoulders. His **SATFINDER** product is as fine as anything I have ever worked with in electronics. In any field. It has been carefully thought out so that even a little old lady who has difficulty dialing a push button telephone can swing the remote controlled antenna from FI on the west to D3 on the east and stop at any of the 11 geostationary satellites along the way. Automatically on command, perfectly, with no glitches or problems. MacZura has learned a lesson I hope others will learn, soon. And that is that quality costs more initially but in the long run it brings results which multiply many fold. I doubt David has any unhappy customers in those 75 installations he's done to date. He routinely gives customers the opportunity to 'update' their remote controlled dishes with newer innovations. He commented that updating of older terminals accounted for \$100,000 in **additional sales** for him in the past six months or so. I cannot imagine any unhappy customer paying even a dime more for something he didn't like.

MacZura's ten foot dish with an Amplica LNA (120) and AVCOM receiver zipped me through 57 active transponders in less than three minutes time. It produced better pictures from ANIK B down here in Oklahoma (perfect on five video transponders) than I have ever seen here on our 20 footer.

Yes, there are less expensive systems around. But I have never been as impressed with the way a total package works as I was with this one. David MacZura and company are to be congratulated because they have resisted the temptation to do something for less money; and they have the guts to say "We only sell the best". And then mean it. David does; he gives a '**satisfaction or your money back**' guarantee with each installation. So far he hasn't had any takers on returning the customer's money.

This industry needs more David MacZuras. It needs quality products that work so well the customer cannot wait to show it off to the whole neighborhood. That is what will make homesats really take off; thousands, no tens of thousands of dedicated viewers who will fight for the continued right to enjoy in their home unrestricted satellite television. David MacZura and company will be in Washington at SPTS '81. Attend his 'The Dealer Dilemma' seminar session and find out for yourself why doing it right is the best way to go!

CSD
TECHNOLOGY



COOP'S SATELLITE DIGEST (Technology Section) is published monthly by Robert B. and Susan T. Cooper doing business as Satellite Television Technology (STT). Editorial offices located at West Indies Video, Grace Bay, Providenciales, Turks & Caicos, BWI. Communication with business office is through Business office at P. O. Box G, Arcadia, OK 73007 (405-396-2574); Rick Schneringer, Manager. Photography, Kevin Paul Cooper; editorial assistance Tasha Anne Cooper. STT produces various manuals, videotapes, guides and texts plus conducts the twice annual SPTS and once-annual SBOC events. STT is not affiliated with any manufacturer or distributor of satellite communications equipment. **CSD** subscription \$50 per year US / Canada / Mexico; \$75 elsewhere. Total contents copyright 1981 STT, USA & Turks and Caicos.

POLAR MOUNT FOR ALL SEASONS

THE MODIFIED POLAR MOUNT

In the search for the perfect antenna mount, the polar mount is often suggested as being the best. However, as everyone soon discovers, a true polar mount can't see any satellites unless you happen to live on the equator. As **figure 1** shows, a true polar mount has an axis of rotation parallel to the earth's axis. But for most locations this causes the antenna to look **over** the satellites, which are relatively close to the earth in astronomical terms.

The first attempt to correct the polar mount's failings is illustrated in **Figure 2**. Here the axis has been tilted down so that the antenna points directly at the satellite. Now, however, rotating the antenna on its axis causes it to intersect the satellite belt in one or at most two locations, depending on the amount of tilt. This method can work adequately if all the desired satellites are fairly close together. **Gibson's Navigator's Manual** suggests ways to adjust this mount to try to see the desired satellites. But no amount of trimming can make this mount work for all visible satellites by rotation on its single axis.

The next attempted improvement might be to **leave** the axis parallel to the earth's axis, but **tilt the antenna down** on the axis. This is illustrated in **Figure 3**. Notice that rotating the antenna on its axis now traces a conical surface. The intersection of this conical surface with the equatorial plane would be a circle centered on the antenna axis. Again, by adjustment of the antenna angle, **perfect** alignment can be obtained at one or at most two satellite locations. Intuitively it seems that the errors at other locations for this configuration would be less than those of **Figure 2**. The maximum error occurs if we would try to look at satellite **S2**. (This assumes the earth does not attenuate 4 GHz; not very practical!)

If we decide that the perfect mount would align on **all** satellites, even those on the far side of the earth; and we combined our previous attempts, we have the modified polar mount illustrated in **Figure 4**. Here we have taken the tilted antenna from **Figure 3** and combined it with the tilted axis of **Figure 2**. Once again rotating the antenna on its axis will trace a conical surface. But this time the intersection of this

by

Ronald Waltner
353 North Kenyon
Indianapolis, Indiana
46219

TVRO enthusiast Waltner has been supplying low-cost (\$2) geostationary satellite aiming charts (computer derived) for several years now. His antenna pointing charts, referenced in STT's 'Home Satellite Handbook', have proved very popular and **CSD** recommends the service.

FIGURE ONE

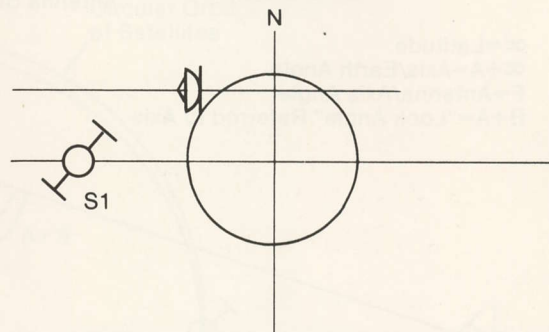


FIGURE TWO

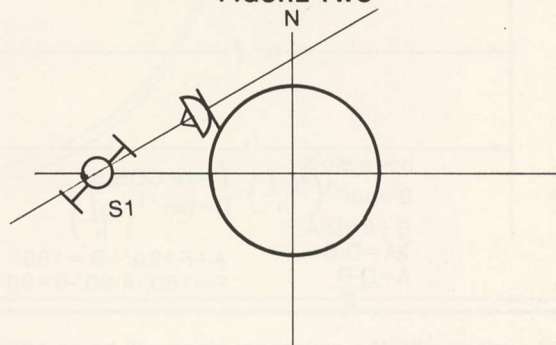


FIGURE THREE

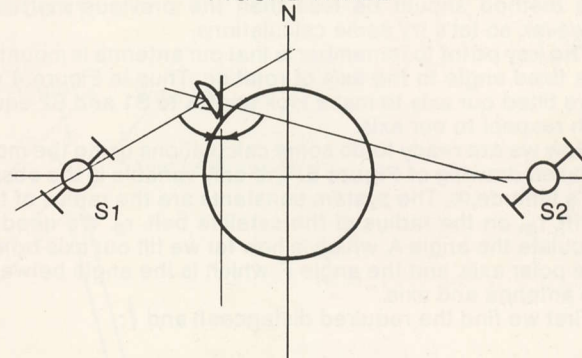
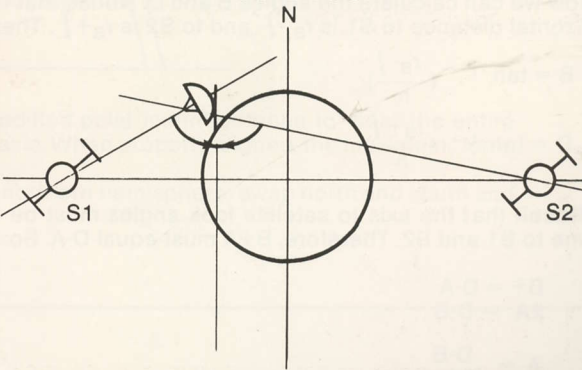
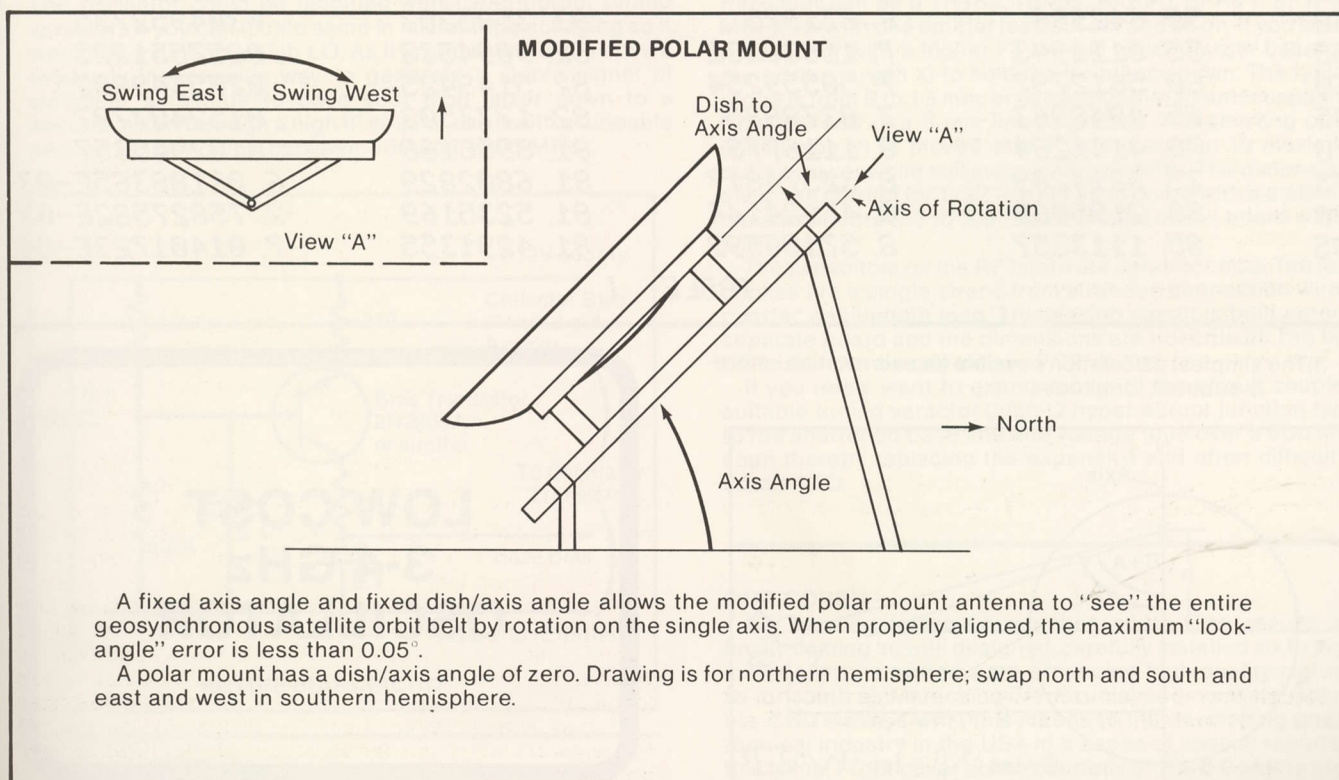
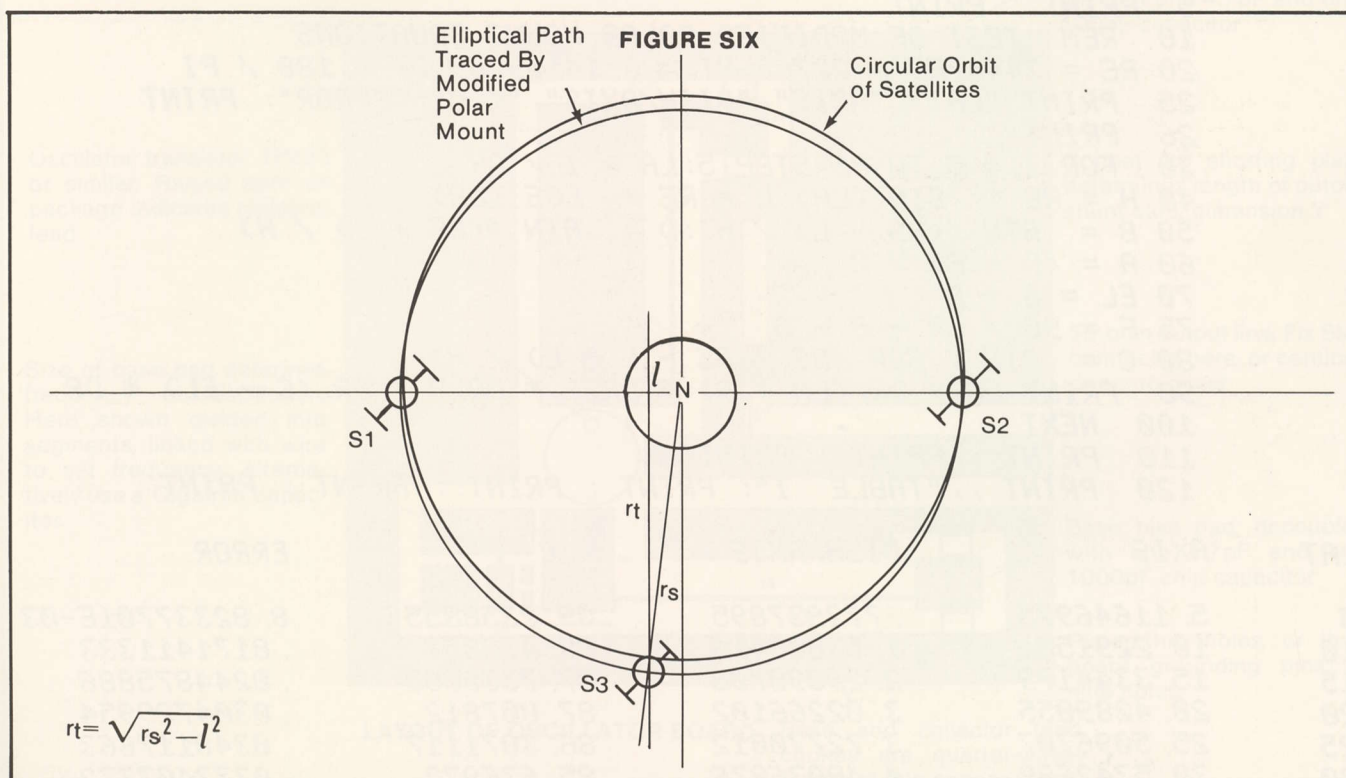


FIGURE FOUR





2) Sees the **entire** satellite belt with an error less than the inherent error of the satellite position itself.




```

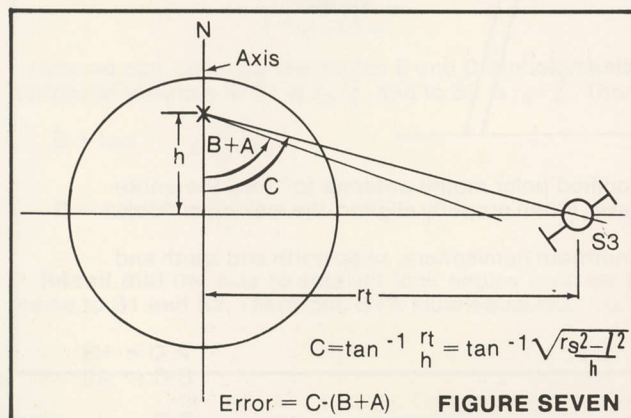
5 PRINT : PRINT
10 REM TEST OF MODIFIED POLAR MOUNT EQUATIONS
20 RE = 3444:RS = 22766:PI = 3.14159269:DR = 180 / PI
25 PRINT "LAT", "AXIS", "DISH/AXIS", "< C", "ERROR": PRINT
26 PRINT
30 FOR I = 5 TO 85 STEP 5:LA = I / DR
40 H = RE * SIN (LA):L = RE * COS (LA)
50 B = ATN ((RS - L) / H):D = ATN ((RS + L) / H)
60 A = (D - B) / 2
70 EL = B + A
75 F = 90 / DR - B - A
80 C = ATN (SQR (RS * RS - L * L) / H)
90 PRINT LA * DR, (LA + A) * DR, F * DR, C * DR, (C - EL) * DR
100 NEXT I
110 PRINT : PRINT : PRINT
120 PRINT "TABLE I": PRINT : PRINT : PRINT : PRINT

```

LAT	AXIS	DISH/AXIS	< C	ERROR
5	5.11646975	.772937895	89.2358855	8.82337701E-03
10	10.229155	1.53888416	88.478257	.0171411333
15	15.3344179	2.29098708	87.7335005	.0244875886
20	20.4289055	3.02266102	87.007812	.0304729954
25	25.5096707	3.72770012	86.3071117	.0348117663
30	30.5742698	4.40036876	85.636972	.0373407772
35	35.6208347	5.03546642	85.0025603	.0380266509
40	40.6481151	5.62836543	84.4085967	.0369620485
45	45.6554954	6.17502372	83.8593206	.034352356
50	50.642986	6.671975	83.3585203	.0304952735
55	55.6111943	7.11630131	82.9094538	.0257551223
60	60.5612797	7.50559254	82.5149425	.0205349902
65	65.4948963	7.8378985	82.1773503	.0152487707
70	70.4141284	8.1116778	81.8986168	.0102945357
75	75.3214209	8.32574817	81.6802829	6.03108365E-03
80	80.2195069	8.47924144	81.5235169	2.75827582E-03
85	85.1113357	8.57156592	81.4291355	7.01401723E-04

TABLE I

3) The simplest calculation possible for axis rotation - merely subtract longitudes.

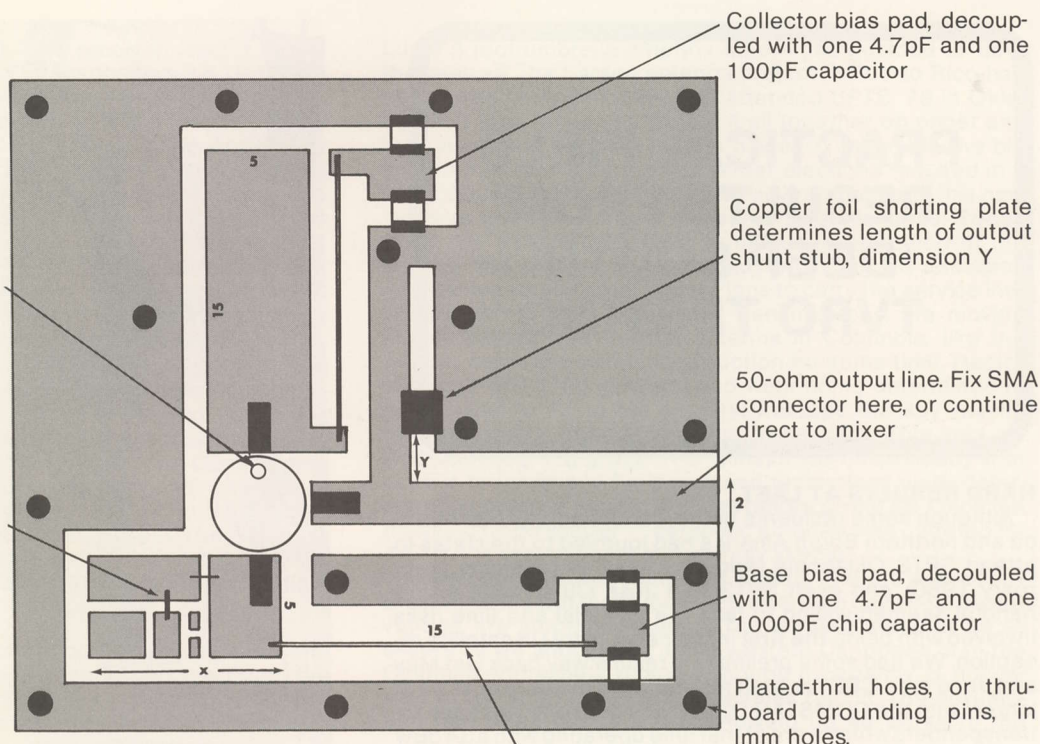


LOW COST 3-4 GHz OSCILLATOR

Builders or designers of low cost private terminal receivers may find the oscillator circuit shown here of value. This unit

Oscillator transistor TP393 or similar. Raised spot on package indicates collector lead

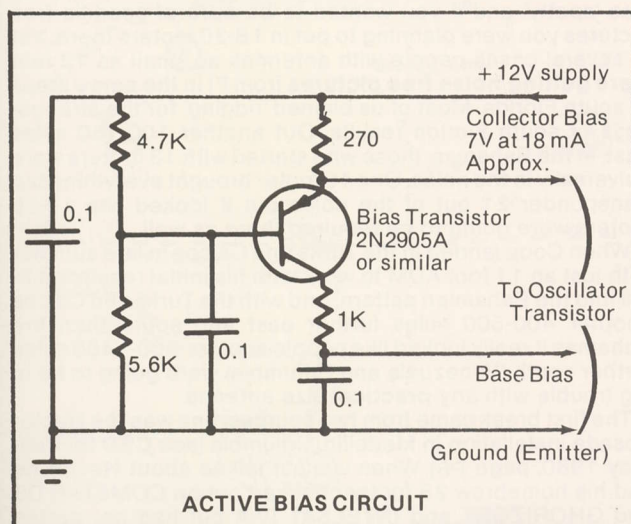
Size of base pad determines frequency of oscillation. Here shown divided into segments, linked with wire to set frequency. Alternatively use a 'Gigatrim' capacitor.



LAYOUT OF OSCILLATOR BOARD

Base and collector feed chokes are quarter-wave-length of thin copper wire.

will produce 10 mW of output power in the 3 to 4 GHz range. The oscillator could be modified with hyper-abrupt tuning varactors if you can locate same in microstrip packaging so it would be a tuneable high LO. As it is shown here you have a relatively inexpensive way to generate a stable signal of sufficient amplitude to drive your high mixer down to a second mixer (through a high IF strip) or use it with a tuneable second LO operating between 500 and 1500 MHz.



ACTIVE BIAS CIRCUIT

By Steve J. Birkill
Grenoside, Sheffield
England

Total cost should be in the \$10 range. The oscillator transistor can be a TP383, TP491, BFR90, BFR91, BFW 92, MRF901 (with one emitter lead cut off) and so on. If you select a transistor with a higher F_t you will need a larger base pad (tuned line length X) to hold the frequency down. The typical range is from 5 to 15 mm, or use a Gigatrim trimmer capacitor from the end of a 5 mm line to ground. The shorting piece (dimension Y) is moved about by the builder to maximize output power while still maintaining stability. The dimensions given are correct for 1/32" (0.031 inch) board with a dielectric constant in the 2.3 to 2.6 region (most Duroid board will do just fine).

The capacitors on the RF board are ceramic chips. The feed chokes are a single strand from stranded connection wire, a quarter wavelength long. The biasing circuit is built up on a separate board and the dimensions are not critical. The bias transistor can be any silicon PNP device.

If you really want to experiment with the circuit couple a suitable tuning varactor (high-Q hyper-abrupt junction type) to the shortened base line and voltage tune over a 500 MHz span thereby replacing the expensive and often difficult to obtain VTO.

OUR COVER -

US satellite television marches south. The results are finally coming in; well designed, carefully installed six to eight meter antenna systems are producing high quality pictures as far south as Maracaibo (Venezuela) and northern Columbia. CSD surveys what this means to the developing private terminal industry in the USA in a series of special reports in this issue. Front cover photo courtesy of Hero Communications; their six meter mesh surface dish now producing flawless pictures well down into the Caribbean.

PRACTICAL FIELD RESULTS FROM 'DEEP SOUTH' TVRO TESTING

HARD RESULTS AT LAST

Although some residents of the Caribbean, Central America and northern South America had journeyed to the states to attend SPTS Oklahoma (August 1979), SPTS Miami (February 1980), and even SPTS San Jose (July 1980) only a handful seemed willing to take the financial and time risks involved with being **the first** in their area to try US satellite reception. We had some preliminary results way back last May and June (see **CSD** for both months); but these results were largely with the COMSTAR D3 bird and then only on those six transponders which were at that time operating with a 34 dBw boresight signal centered on San Juan, Puerto Rico. The results with antennas as small as 12 feet were quite good but unfortunately the amount of television programming transmitted on the San Juan beam is minimal; perhaps six to ten hours per week. Logic suggested that nobody was going to install terminals for such a small amount of television per week.

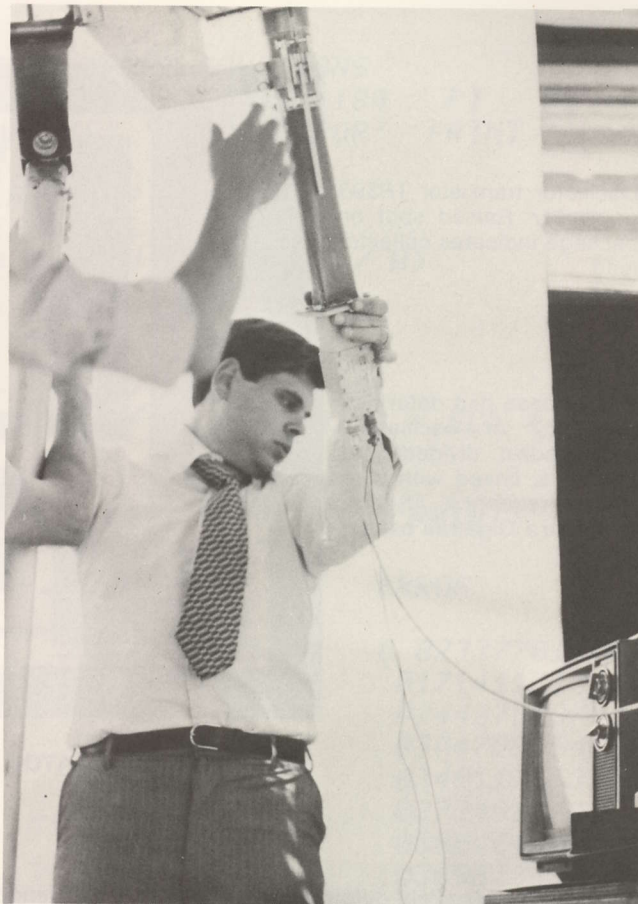
Way back last summer, when Bob Luly showed us his umbrella antenna at San Jose, we got Bob's promise that when a 15 footer was available we'd get the first one. We intended to pack it into a two engine airplane and tour throughout the Caribbean et al seeing just what could be done in the 'outback areas'. Numerous SPTS attendees and

CSD readers in this part of the world read of our plans and promptly invited us to 'stop by'. We had the itinerary filled up by September...but no antenna from Luly. Lacking an easily transported antenna we saw no point in heading south.

Pressures meanwhile were mounting on those suppliers who had the know how to deal in these regions; Bob Behar in particular was getting several serious inquiries per week from people who said "the cost does not matter...if it works". That remained a substantial if of course. Behar went so far as to seriously consider transporting a petal type parabolic of 16 feet diameter from country to country and battling the customs and freight forwarding agents at each stop. But while an antenna can package reasonably small the mount required is quite another matter; and Behar wisely dropped the project after deciding what should be a ten day trip could easily stretch out to a month or more. The key remained to get our hands on a Luly antenna of sufficient diameter to make meaningful measurement tests.

While we were waiting for the proper equipment, others were setting out to take that financial and time risk. They simply wanted to know what could be done. People like Bill Larsen (see **CSD** front cover for March 1980; page T14 same issue) rolled up their sleeves and went to work. These were people who were serious enough to be putting together first class installations utilizing some pretty big antennas.

Up to the time of the data to be reported here, from Columbia and Venezuela, it did not **look** good. The bird of prey was of course FI. Test results from Bermuda (with a low look angle in the 10 degree region) were disappointing. It



BOB LULY UMBRELLA ANTENNA - burning up the airwaves during a test by Coop and Bob Behar in Southern Florida in mid-February.

looked like nothing smaller than ten meters would do the job. The Bahamas **mis-lead many of us** for awhile. We already knew from more than 100 installations that southern Florida was 'spotty' and if you wanted to be **sure** of sparkie free pictures you were planning to put in 18-20 footers there. Yet in several cases people with antennas as small as 13 feet **were getting noise free pictures** from FI in the **same** areas of south Florida. Most of us blamed 'ridging' for the strangeness of south Florida results. Out another 100-150 miles east, in the Bahamas, those who started with 13 footers were universally in the noise. One 16 footer brought everything but transponder 21 out of the noise but it looked like 18-20 footers were going to be required there as well.

When Coop landed in the Turks and Caicos in late summer with just an 11 foot ADM to work with his initial results on FI fell into the Bahamian pattern; and with the Turks and Caicos another 400-500 miles further east and south than the Bahamas it really looked like people another 800-1400 miles further south (Venezuela and Columbia) were going to be in big trouble with any **practical** size antenna.

The first break came from two sources; one was the Hector Posada installation in Medellin, Columbia (see **CSD** for February 1980, page P6). When we last talked about Hector he had his homebrew 28 footer checked out on COMSTAR D3 and GHORIZONT and INTELSAT IV-A but had not gotten around to FI yet. Just days before another group, using a 8.3 meter reflector salvaged from an old terrestrial scatter link in Maracaibo, Venezuela would locate F2 and then F1, Hector finally did locate FI. What he found was almost too good to be true. Using a 120 degree Kelvin LNA, a Chaparral feed and an

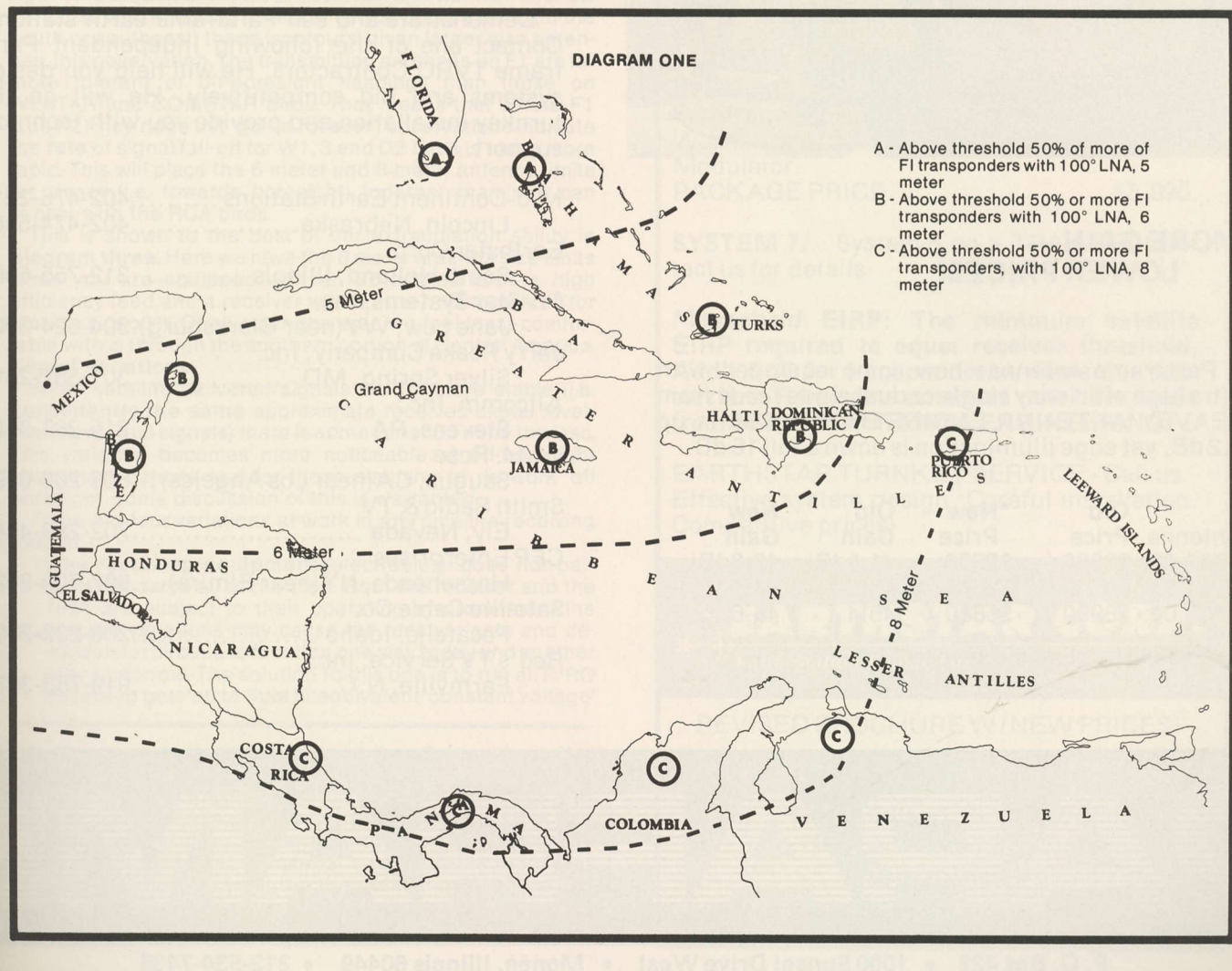
older style Microdyne 1100 TVR receiver Hector found threshold or above signals on FI transponders 2,6,10,14 and 22. He also found an equal level signal on SATCOM F2, transponder 8 (the NBC network channel used to relay programs between Los Angeles and New York). Apparently the same day, hours after Hector, a group of technicians who had been working first with a 12 footer (successful results on D3) got a feed fitted on a 28 footer. Loading it with a 100 degree LNA and a Scientific Atlanta receiver, this group first found F2 and the transponder 8 (NBC) signal. They measured a 7.0 dB carrier to noise ratio; about what you might expect with a **ten** footer and a 120 LNA in **Tennessee** or Utah. Excited they wrestled the antenna further west looking for FI.

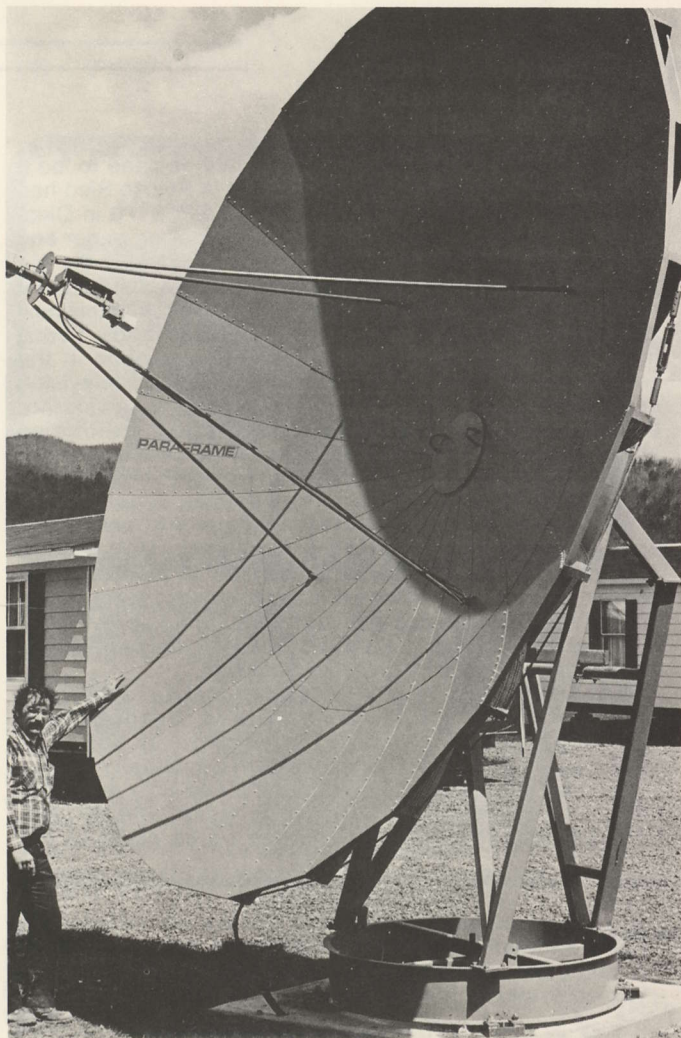
Meanwhile others with decent equipment and a combination of first timer luck and/or some skills were getting signals in Jamaica and Costa Rica. A six meter installation in Jamaica found the twin WESTAR birds first; every transponder they tuned in with a 100 degree LNA on their Hero Communications six meter and Washburn receiver was well above threshold. They too ran through SATCOM FII and found the NBC feed on transponder 8; above threshold. The next stop was FI where after some alignment difficulties they too found at or above threshold pictures on virtually all of the vertical and horizontal transponders.

Why were the 'positive' results sudder ly coming in? Seemingly all at once! It appears while many scattered from the eastern Caribbean across northern South America northward through Central America were awaiting the planned trip with

Luly's 5 foot umbrella antenna others had decided to 'do it themselves'. The Larsen antenna project in Puerto Rico had been under way since Bill first attended SPTS '79 in Oklahoma. It took him a year to get it all together on paper and then hundreds of hours of man power to assemble the big spherical. In Jamaica the November elections resulted in a rapid change in the local business environment and this new 'positive attitude' brought out some investor funds. **Today** there are **several** six meter terminals in operation in the country and at least one is already providing US television service to a tourist hotel there. Plans to carry the service into the airwaves, using scrambled transmissions, are moving ahead rapidly. The Posada antenna in Columbia, like the Larsen, had been under construction for some time. Hector attended SPTS '80 in Miami and went home determined to bring satellite TV to his country. Perhaps the key results however came from Maracaibo, Venezuela. This was an American effort; a group from a major US oil company with access to funds and hardware and technology were determined to exhaust the possibilities before giving up. Once the modified tropo scatter parabolic antenna was outfitted for 4 GHz the rest became surprisingly simple.

Based upon these results the signals that are apparently present, at least in those locations where we have field observations, are surprisingly good. The **ridging** may **not** be as severe as we anticipated in the western Caribbean or in the Columbia-Venezuela region although it certainly is noticeable in the southern Florida/Bahamas region. The assumption had been that if it was showing up **so close** to the





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predicted boresight region (i.e. south Florida) it would be even more severe (and unpredictable) as you moved further off boresight. If that is a valid assumption then those who have gotten operating (in Jamaica, Venezuela and Columbia in particular) to date have been extremely fortunate. **Ridging has been a minor problem.**

Based upon all of the private and commercial terminal results we could collect and verify a number of map-charts appear here. In **diagram one** we have antenna size 'contours' based upon the criteria that the antenna will be utilizing a high efficiency feed (Chaparral or equal), a 100 degree (or better) LNA and a receiver with a threshold in the 7 to 8 dB region. It shows where you **should** be able to go in safely with a 5 meter, 6 meter and an 8 meter antenna equipped as described and anticipate threshold or above reception on no fewer than 50% of the F1 transponders today in service. Understand there is no way to **guarantee** results in advance; but based upon the best data available this looks to be the case. If any of the data is shakey, it would be in the Panama-/Costa Rica/Nicaragua region. Older results from Panama (based upon a US military installation now several years old) runs counter to **this** data but nobody has ever visited the site with the credentials to confirm that their 'spotty-transponder' results are not due to some human factors.

In **diagram two** we look at the apparent coverage limits for reasonably sized antennas (5 meters) on WESTAR 1, WESTAR 3 and COMSTAR D2. The criteria is for a 5 meter antenna equipped with a high efficiency feed and a 100 degree (or better) LNA plus a receiver with a 7-8 dB threshold. Again, the area where we feel uncertain is in Central America. For those who might wonder how far you could extend (to the south or southeast) these 'contours' given larger size antennas, this observation. The transmitting antennas on F1 are far more tolerant of off-boresight headings than those on WESTAR and COMSTAR birds. That means that where F1 (and F2) may ridge but **'go on forever'**, observations indicate the **rate** of signal fall-off for W1, 3 and D2 birds is much more rapid. This will place the 6 meter and 8 meter antenna limits far closer (i.e. towards boresight) together than one can expect with the RCA birds.

This is shown to the best of our extrapolation ability in **diagram three**. Here we have the 8 meter antenna size limits when you are equipped with an 85 degree LNA, a high efficiency feed and a receiver with a true 7 dB threshold for moving video (*). Once again the area we feel least comfortable with is through the southern portion of Central America. **Signal Variations**

While satellite delivered signals are far more stable (i.e. **consistently the same** approximate received signal level than terrestrial signals) there is some variation none the less. This variation becomes more noticeable at off-boresight receiving locations and for those planning to do work 'off boresight' some discussion of this is warranted.

There are four variations at work in **any** satellite receiving system:

- 1) **The receiving equipment** (electronics)...does not perform the same all of the time. Both the receiver and the LNA are subject to their operating environment. Line voltage variations may cause the receiver gain and demodulator circuits to function one way today and another way tomorrow. The solution to this one is to run all TVRO receiving gear off of Sola or equivalent 'constant voltage'

* - There are several 'tests' for determining where the observer finds threshold noise impulses noticeable or objectionable. A static display, such as a color bar test pattern, will typically show noise impulses when it is 1 to 2.5 dB stronger than so-called 'moving video'. Moving video is simply 'program material' and because the video scene is constantly changing the noise impulses are not as apparent (although still present) as they will be on a (fully saturated) color bar pattern.

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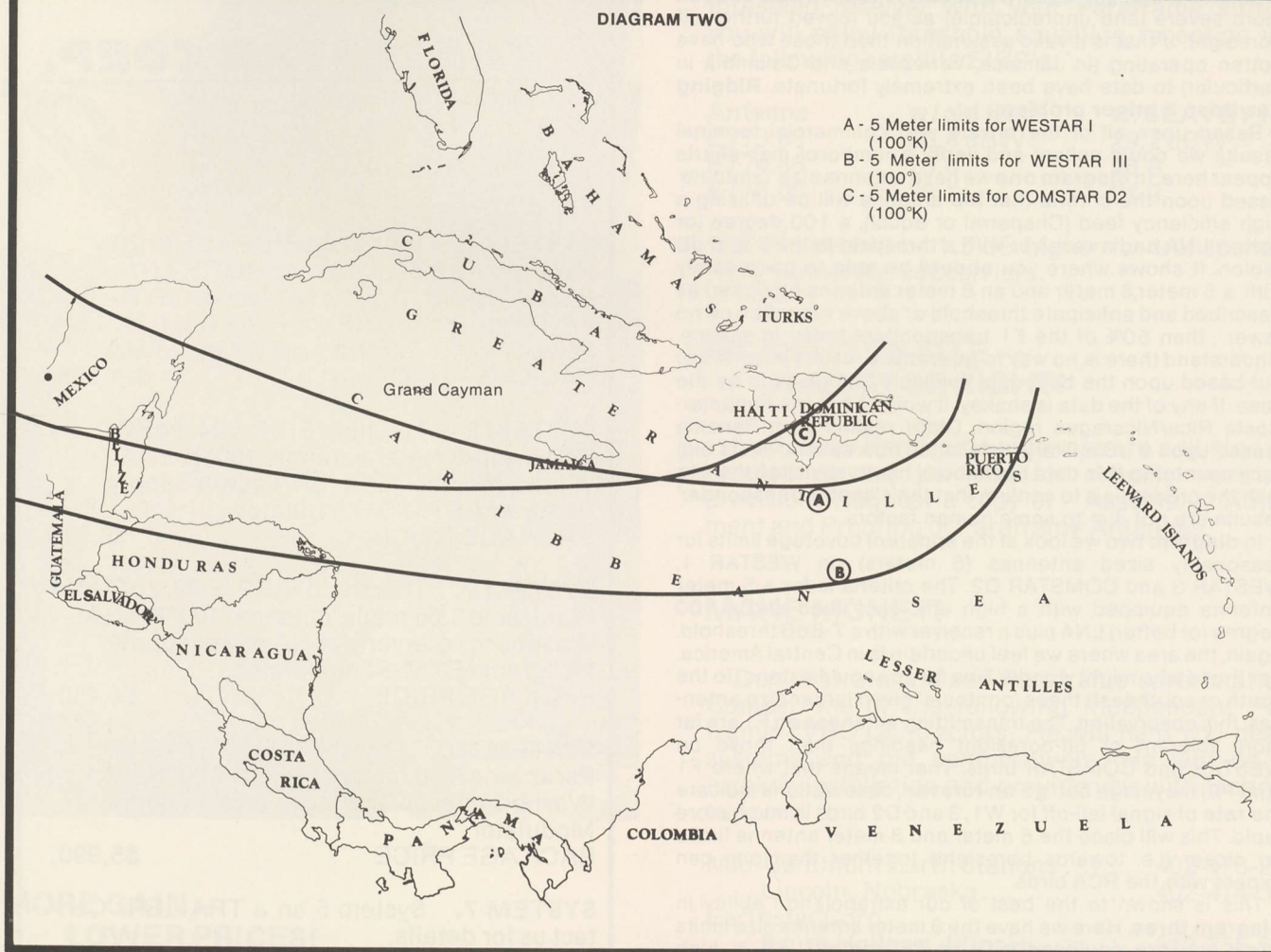
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DIAGRAM TWO

- A - 5 Meter limits for WESTAR I (100°K)
- B - 5 Meter limits for WESTAR III (100°)
- C - 5 Meter limits for COMSTAR D2 (100°K)

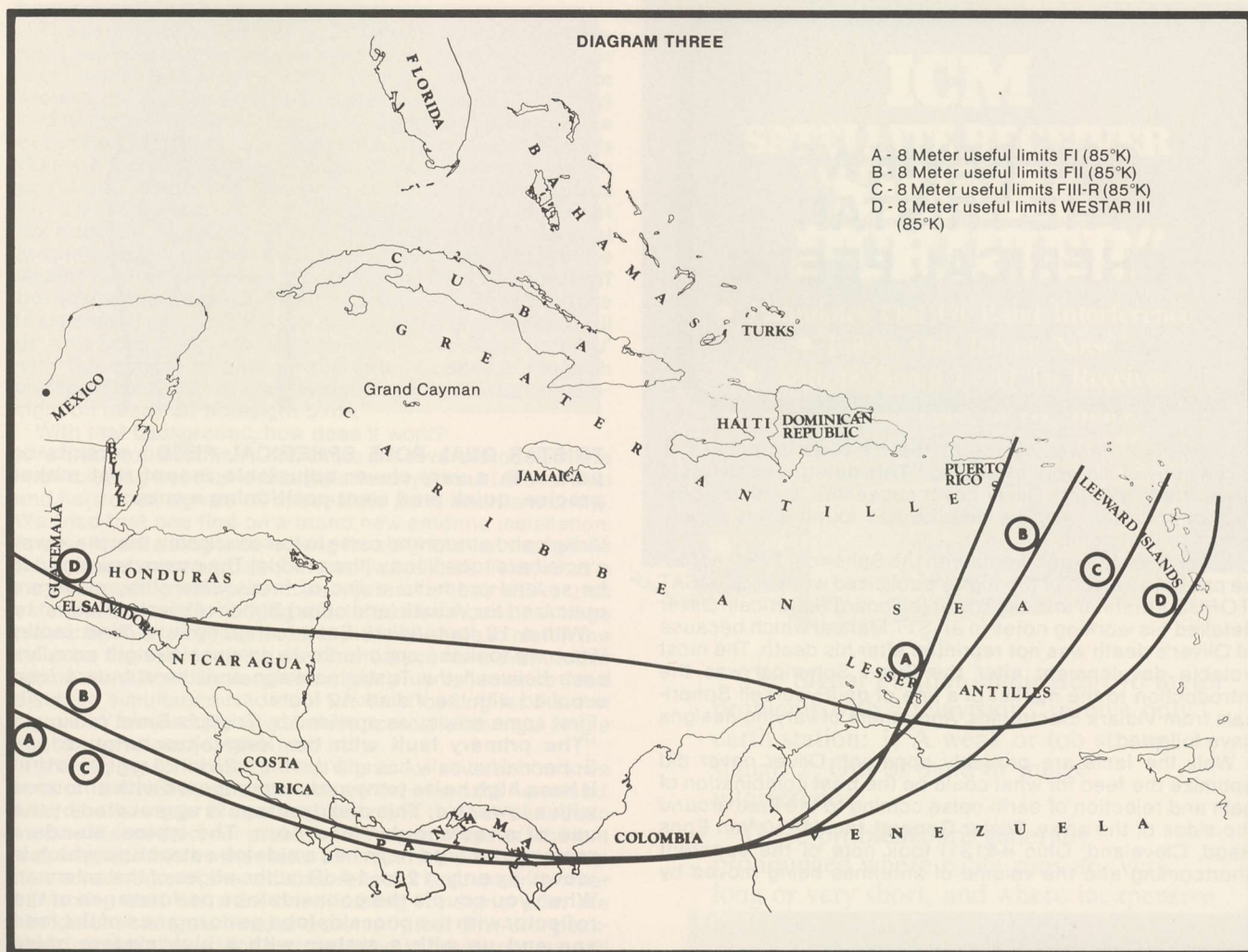


transformers. The LNA is less affected by (reasonable) excursions in voltage than it is by heat. An LNA that 'bakes' in the sun is going to run 'hot' and in southern latitudes 'hot' can be blistering. The solution to this one is to get the LNA under cover somehow. You'll notice this effect (increase in sparkie noise) by observing that pictures are better at night than in the daytime.

2) **The birds are flown to boresight**...which means that by ground command their transmitting antennas are kept positioned at their boresight point either automatically or by human command. Into this guidance system is built tolerances; the ground command system monitoring the bird's boresight heading allows the bird to drift off of boresight by some pre-determined 'safe' amount before a correction is made (correction requires firing of miniature control rocket jets). As birds age and the supply of correction fuel goes down the 'safe window' the bird is allowed to 'drift' off of boresight is expanded, to save fuel. When you are in low the .1 or .2 dB variation in signal may not be noticeable. When you are way off boresight the variation may be as great as 1 dB (because of the ridging effect on the transmitting antennas) and changes of this magnitude are noticeable. There is no solution to this one except to have more signal to begin with; i.e. use a bigger antenna to get further above threshold. For most it is an 'understand and tolerate' situation.

3) **All birds are moving at all times.** They not only have the obvious forward motion (which matches the rotational speed of the earth on its axis) but they also have a 'drift'

speed. Most of the satellite operators attempt to maintain (by ground control of thrusters) the satellite within a 'box' that is from 70 to 140 miles on a side. All of the US/Canadian satellites of interest to us here want to drift, on their own, **back to the east**. By careful triangulation the satellite operator determines precisely where in the 70 to 140 mile wide box (east-west) the satellite is at any given moment. As the satellite drifts eastward it approaches the eastern edge of the imaginary box drawn in space. When a 'limit' (near the edge of the box) is reached the ground controllers fire miniature thrusters for a fraction of a second, sending the satellite scooting westward to the opposite end of the box. There it lingers for a day or less and slowly begins drifting eastward again. If you have a relatively small receiving antenna (5 meters or under) this west to east to west movement would be hard to measure (by precise peaking of your antenna on a day to day basis). Larger antennas have narrower beamwidths however and by the time we get to 8 meter size antennas that 70 to 140 mile variation can be seen as changes in signal level in the .2 to .3 dB region. The 'drift' cycle from west to east varies as a function of the time of year and recent solar activity (solar radiation imparts tiny amounts of additional pressure on the bird). **On the average** the 'box movement' activity occurs about once per month. Now if you have a **large** antenna and you happen (by dumb luck) to get it peaked on the bird in the last few days before the bird is 'thrust' from the eastern edge of the box to the western edge, the day the thrusting takes place you will



notice the sudden change (drop) in signal level. HBO and SHOWTIME have for some years transmitted bird position information (relative to the respective F1 box) once per month in the past; whether they continue to do that is not known. If you can locate this data it will help you pinpoint your own signal peaking activity. If you align one day and the signal varies suddenly in a day or two, downward, chances are the ground controllers have moved it back west in the box.

- 4) **When you have low look angles to the bird...** your signal travels through more and more of the lower atmosphere before it reaches your dish. The lower atmosphere is where all of the weather takes place and 4 GHz signals do not like weather. When your look angle is down in the 15 degree region or lower you can anticipate that there will be occasions when lower atmosphere weather, between your antenna and the bird, out there for perhaps a few to 50 miles (depending upon your look angle; it increases in distance as the look angle drops) will adversely effect your reception. Again there is no solution to this one; it is an 'accept' situation.

One final factor associated with low look angles is the **earth noise** problem. All antennas and all feeds have 'sidelobes' or the ability to pick up signal from off the side of the respective antenna surfaces. As you go lower and lower in look angle these sidelobes come down closer and closer to the earth. Eventually they fall on the earth or ground out in front of the antenna, or they fall into a clump of trees off to the

side of the antenna. These 'living organisms' are effective 290K sources of noise. Fortunately for you your antenna sidelobes are typically 'down' (or less responsive than the main lobe) by 14 to 20 dB or so. And therefore any sidelobes that intercept earth noise will do so 14 to 20 dB down from full antenna gain. Still, there is noise being added to the system 'noise temperature' in such situations. One solution is to investigate the addition of an **antenna shroud** (a lip-like device that fits around the outer surface of the dish reflector). A shroud, **properly** designed and installed, can reduce or eliminate signal pickup from sidelobes in a low look angle situation. The appropriate source for information on shrouding is your antenna designer or supplier.

TRI-STAR'S SPHERICAL FEEDS

From the day Oliver Swan first conceived the Spherical TVRO antenna (see **CSD** for November 1979...if you can locate a copy!) there has been argument after argument over whether Oliver really **optimized** his feed system. Those who are familiar with Oliver's work, either through **CSD**, through his attendance at the first SPTS, or through the wonderful collection of videotapes we have of his pioneering work in rural Arizona, already know that the developer of the TVRO Spherical was a man who cut and tried; again, again and again. He kept playing, putting if you will, keeping careful records of his work and his results.

Oliver was not comfortable with theoretical dissertations on anything. If he could not build it with his hands, play with it,

CSD REVIEWS THE TRISTAR SPHERICAL FEEDS

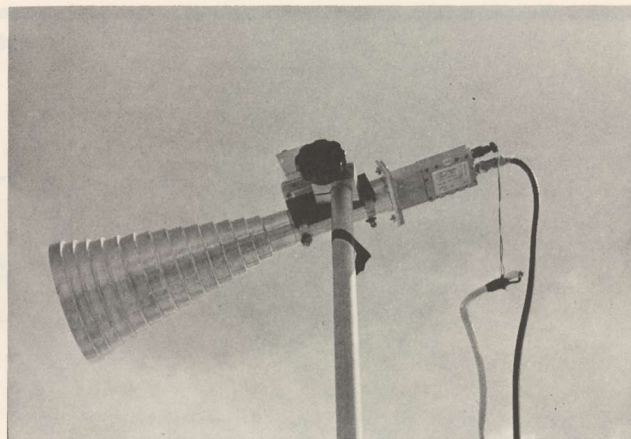
and modify it, he was not interested. He was also the first to qualify any of his work by stating **"This design is the best I have tried to date"**. Oliver never suggested it was the best design possible; only the best he had found in his experiments to that point.

Oliver Swan's experiments with the Spherical TVRO antenna pre-dated much of the highly publicized work of COMSAT (TORUS Antenna) and US Tower (billboard Spherical). Oliver detailed his working notes in an STT Manual which because of Oliver's death was not reprinted after his death. The most notable development after the Swan Spherical was the introduction to the market of a line of do-it-yourself Sphericals from Vidiark Electronics. And others of varying designs have followed.

Well, the facts are probably apparent; Oliver never did optimize the feed for what could be the **best** combination of gain and rejection of earth noise coming to the feed around the sides of the array. Tristar General, Inc. (4810 Van Epps Raod, Cleveland, Ohio 44131) took note of the apparent shortcoming and the volume of antennas being moved by



TRISTAR FEED plus VIDIAK 12 FOOTER during check out on Provo. We found the TRISTAR feed adds just under 1 dB of gain to the system; a worthwhile improvement according to check-out engineer Kevin Cooper, here holding support in sand.



TRISTAR DUAL POLE SPHERICAL FEED - mounts on pole with a very clever adjustable mount that makes precise, quick feed slant positioning a snap.

Vidiark and others and came to the conclusion that there was a 'hole' here to be filled with a product. The product turns out to be several products; a line of feeds which they claim are optimized for Vidiark (and other) Spherical design antennas.

With a 12 foot Vidiark Spherical going in at West Indies Video we took the opportunity to do some straight comparisons between the Tristar package and the standard feed supplied with the Vidiark 12 footer.

First some theory, as provided by Tristar's Dave Yanko.

"The primary fault with the long-focus antenna (the Spherical typically has an f/d in the 1.25 to 1.5 region) **is that it has a high noise temperature compared with antennas with a lower f/d . This disadvantage is aggravated by the use of a rectangular feed horn. The typical standard rectangular feed horn has a sidelobe structure which is 'down' by only -12 to -14 dB (at the edges of the antenna). When you couple the poor sidelobe performance of the reflector with the poor sidelobe performance of the feed you end up with a system with a high system noise temperature and a degradation of the system figure of merit"**.

What Yanko says is basically true. Noise in the system is of course the one common enemy all system designers/installers fight. Noise from the earth (approximately 290K) is always present. An antenna surface that 'sees' the earth on sidelobes is going to put some of that noise at the feedpoint. A feed antenna that sees more than the reflector surface must by nature look at some of the earth around the reflector. This noise also ends up inside of the feed. The combination of the two noise sources creates a 'noise floor' below which no LNA can dig no matter how good the LNA may be.

The Tristar HEF-125 scalar feed appears to have some advantages over the standard feeds employed by most Spherical users. Yanko claims the sidelobe performance is -28 to -30 dB. He also notes that pattern range tests show the E and H planes (the incoming signal wavefront coming to the feed from upper and lower portions of the surface - the E plane - and left and right on the surface - the H plane) to be well 'balanced'. He suggests this results in a illumination efficiency of "78%".

He also notes **"The phasing of the radiated pattern** (from the reflector surface) **results in a true spherical wavefront. This provides a more efficient gathering of in-phase energy, particularly for angles up to 40 degrees either side of boresight'**. This is of course considerably wider than the results have been from the standard Swan-developed rectangular feed. Oliver always maintained that it was the feed, not the reflector, that was the limiting factor for looking at wider orbit belt angles. Yanko may

have something here.

Those who have worked with Sphericals and the standard rectangular feeds are well aware that the feed or focal point is typically 'soft'. That is, you can deviate around the point by quite a bit (several inches typically) and not lose the signal. Having had this background, one of the first things you note with the HEF series of feeds is that the focal point is very tight. Now you have it...then you don't. There is not much margin for error. There is another 'change' from rectangular feeds. The focal point for multiple satellites falls along a line that is parallel (equidistant) from the reflector surface. But not with the Scalar HEF series feeds. For those satellites that are off boresight the distance from the center of the dish surface increases. If you plot the focal points on the ground (as we all do with Sphericals) you find you have a oversized letter 'U' with the bottom or base of the letter closest to the dish surface. That's also where the signal will be for the on-boresight on nearly on boresight birds.

With that background, how does it work?

At first we didn't think it did. There are several models in the line including one that is dual polarized (you can take vertical and horizontal signals off of separate ports simultaneously). We tried that one first on a brand new antenna installation. And we spent a long time looking for a signal even though we thought we knew precisely where it should be. Tristar has a very interesting pole plus mount system for their HEF series of feeds. The pole is nothing special but the mount is. A large plastic knob allows you to swivel the feed angle to match the reflector derived incoming wavefront. If you have ever tried to adjust feed horn angle plus height plus reflector to feed distance simultaneously, all of the time looking for the first signs of a focused signal, you will appreciate having a single knob to turn to adjust the feed horn.

After trying to locate the first signal for several hours we took off the HEF feed and stuck on the standard horn feed. After another hour of messing around in the hot Caribbean sun we discovered our problem; the signal was not where it was supposed to be thanks to an inept helper who had mis-measured some of the antenna reflector adjustments. After correcting that we went back looking for signal with the standard rectangular feed and promptly found it. After peaking it up carefully we took a carrier to noise measurement and then replaced the rectangular horn with the HEF feed. Now we found the focal point again and sure enough it was much more compact (i.e. less tolerant of placement error) than with the rectangular feed. A second carrier to noise ratio check and we found we had gained nearly 1 dB in carrier to noise ratio.

Next we repeated the test on a couple of additional birds to be sure we were not the victim of measurement or pointing errors. Averaging all of the checks run on several different transponders across the band we came to the conclusion that we could expect around 0.85 dB (or nearly 1 dB) improvement with the HEF series feed over the standard feed provided with the Vidiark 12 foot Spherical.

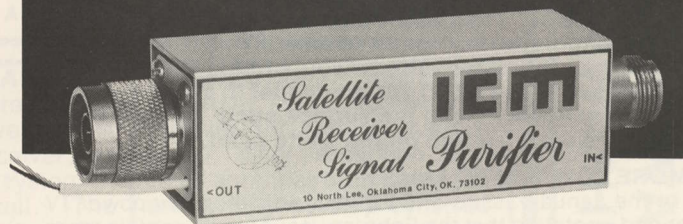
It appears to us that the Tristar feeds and the mounting system are worthwhile additions to the TVRO marketplace. Developer Dave Yanko gets a little heavy in his theory in some of this explanations sometimes but the real proof is the performance of the hardware, and the workmanship you can expect with the products. Both get high ratings from us.

PAINT YOUR DISH?

Recently I was fortunate enough to get my hands on a 10 foot (aluminum) parabolic dish from a local telephone company. I plan to erect my earth station in my backyard and would like to paint the dish surface white thus changing the dull grey color it now has. The type of paint I plan to use is Tremclad. My question is simply will painting the dish effect the performance of the dish (i.e. gain, noise temperature,

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etc.)? If the answer is yes, what type of paint would you recommend?

Mike Kasmetis
RR #2
Peterborough, Ontario
K9J 6X3

Raw aluminum is very difficult to paint. Fortunately you already have some paint on the surface and since it was acquired in that form we must assume the original paint was properly put on. Years ago the antenna manufacturers tried to make painting of dishes 'high technology' and they pushed a \$260 a gallon (in 1977) light scattering white paint. In 1978 Coop painted a ten foot fiberglass dish with Sears All Weather Latex house paint. It is still pristine today while the \$260 a gallon stuff has had to be repainted several times. He subsequently painted a 20 foot all steel dish with the same Latex and it seemed to work just fine. Oh yes, if you have a raw aluminum dish you must get the surface extremely clean ('pure') before anything else. Then apply zinc chromate using a light spray technique first, followed after drying with a heavier coating of the same stuff. If you surface runs or peels you'll have to use a 600 grit sandpaper to clean it up, and re-prime. Finally clean the surface again with isopropyl alcohol before putting on the white paint.

MORE LOW POWER TV!

In the January issue of **CSD** your article on low power TV ended by stating that the February issue would contain more information. After reading the February article I feel there is still information we need. I would like to know the addresses and telephone numbers of those firms that offer equipment in this field. Also, anyone thinking of putting a low power TV station on the air in a large city had better slow down and look at UHF. I did this and after having COMPUCON do a fre-

quency search and all of the engineering (that cost me \$650) I found out the only channel clear in my area is channel 30. The cost of a 100 watt UHF station looks to be in excess of \$32,000; of which \$22,000 is for the transmitter while the transmission line costs \$11 per foot and the transmitting antenna is another \$10,000. That is a long way from the \$12,000 mentioned by Coop in the January **CSD**!

Michael L. Comer
Manassas, Virginia 22110

Ooops. The March issue probably shed considerable new light on how you go about figuring out your own drop in 10 watt VHF channel. We think the UHF people are just one step this side of being rip off artists. \$22,000 for a 100 watt UHF transmitter is an insult to intelligence. The only marketplace for UHF gear has been off-shore (where money doesn't seem to matter) or to TV stations largely looking to fill in reception holes in their coverage with UHF translators. There are probably 15 people reading this who have the talent and experience to bring into the marketplace a 100 watt UHF TV transmitter, capable of FCC type acceptance and capable of reliable operation, for no more than \$5,000. If the \$22,000 100 watt UHF transmitter is an affront to technology, the \$10,000 transmitting antenna is a terrible example of being greedy. There is no reason why somebody cannot design and manufacture such an antenna with gain, and an omni directional pattern for under \$1,000 each. The time has come for talented people to go to work on bringing down the costs of all of this equipment. UHF is no longer a mystery to engineers. There is no justification for 'mysteriously high' charges for UHF equipment. All of this aside, there is plenty of room for 10 watt VHF low power stations at the \$12,000 price quoted; including the TVRO!

TECHINCAL NEWS NOTES

ICM has replaced 4300 receiver with newer **4000** model. Called 'refined version of previous models', 4000 features 6.2 and 6.8 audio, relative signal level meter, remote metering jack, Taylor Howard designed demod circuitry, AFC, LNA powering, audio sub-carrier output. **Also new** from ICM is tuneable sub-carrier detector with stereo capabilities.

What will be new at SPTS '81? Vidiark Electronics showing three new TVRO receivers, all using single conversion image reject mixer approach. **DEXCEL** combination LNA plus downconverter package (70 MHz IF output) scheduled to debut first quarter...did. Production samples were in hands of lucky few in mid-March and new package with 100 degree LNA up front but housing no bigger than standard LNA will create quite a stir in Washington (especially when the price is announced). In other show LNA activity, **LNA** 'show special' prices for 120 degree units will perhaps drop to under \$450 in

reasonable quantities. **Antennas that track** through orbit belt (Satfinder, Hero) will attract wide spread interest as will new **split-package TVRO receivers** (more and more is ending up at the antenna). Concern over LO (local oscillator leakage) out of input port on single conversion receivers will surface and be hotly debated with some warning that unless industry designers police problem and find solution, FCC may be forced to step in and establish regulations. **Combination TVRO receiver / 10 watt VHF translator** may be unveiled at SPTS - unique because of use of Japanese proprietary chip that turns satellite FM directly into NTSC AM, for terrestrial retransmission. Complete do-it-yourself **package** with totally wooden antenna priced at around **\$1750 list** will probably be least expensive 'system' offered. Several previous exhibitors will be noticeably absent - victims of intense competition now being generated in field. Receiver designers, looking for ways to reduce receiver costs without sacrificing performance, will deal with explosion in something called 'Hi-Mic' technology; packing of receiver sub-sections in encapsulated mini-circuits produced in thousand up quantities. **And everyone will wonder how so much NEW technology could be created in just five months since Houston SBOC!**

Confusion over which F1 and D2 services will end up where...after launch of RCA FIII(R) this summer continues. Subject to change, best scenario now calls for launch of 3R June followed by switch over of present F1 services to F3 (R) around 1st of September. D2 services not going to F3R (3R will have four new for cable transponders plus additional transmission power) will then move to F4 scheduled for early 1982 turn on. RCA and FCC and programmers still locked in debate over 'fairest way' to accommodate the competing interests. As soon as the water clears, we'll have detailed report in **CSD**. Provided F3 and F4 both 'fly' properly, private terminals will benefit substantially with additional (free) program services and stronger signals in almost all areas.

SATELLITE OPERATIONS PARABOLIC ANTENNAS SATELLITE NAVIGATION

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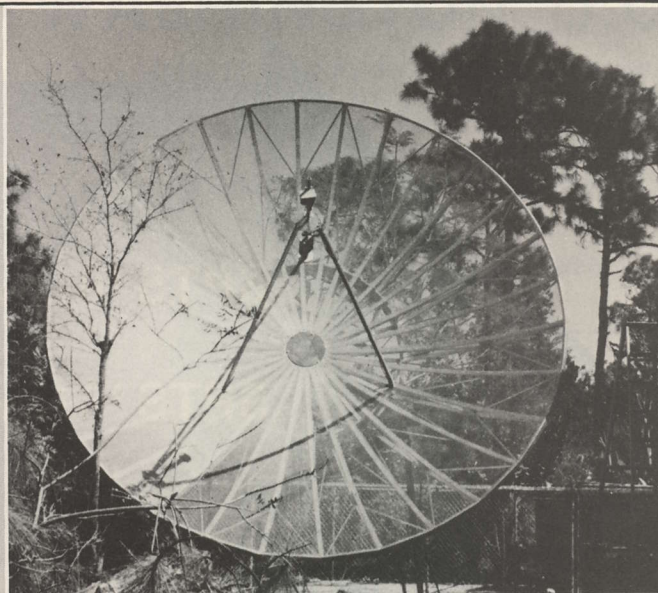
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Three information and equipment filled days starting at 10 AM on April 17th [but we suggest you arrive on April 16th to watch the antenna setting up exercises] and closing at 3 PM on April 19th. As many as 2,000 satellite TV enthusiasts, from would-be dealers and distributors to technology/equipment designers and innovators will be on hand to share and learn all there is to know about low-cost satellite TV terminals! Twin sessions featuring "business opportunities" and "satellite technology" will focus on the important state-of-the-industry today. PLUS - an opportunity to share our technology with important Senators, Congressmen and their Aides. AND - if the lodge at The Shoreham, more than 30 hours of "in-room" satellite TV programming from past SPTS/SBOC events; the history and technology of an industry being born!

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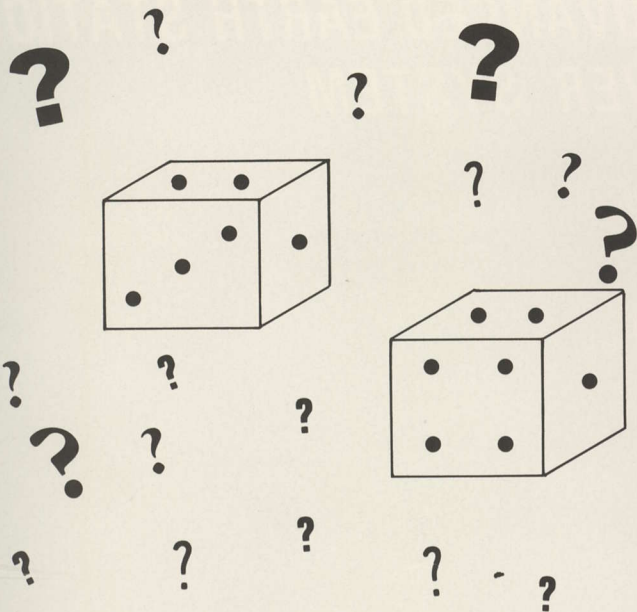
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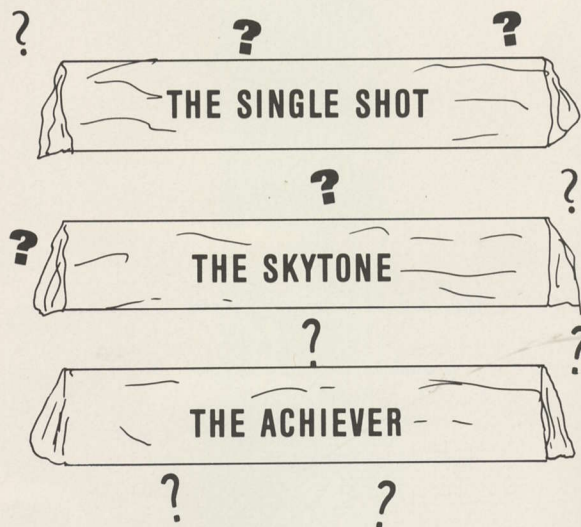
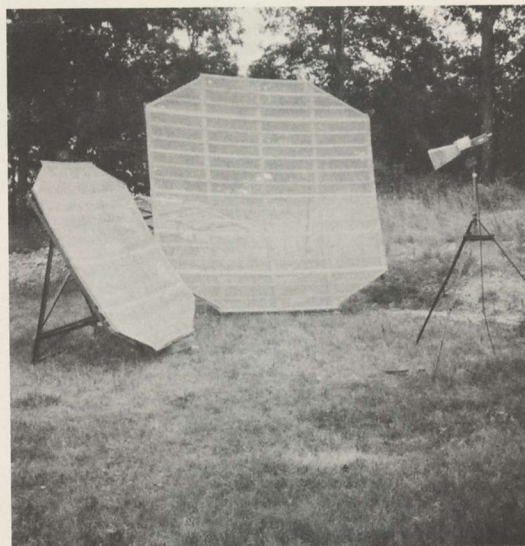
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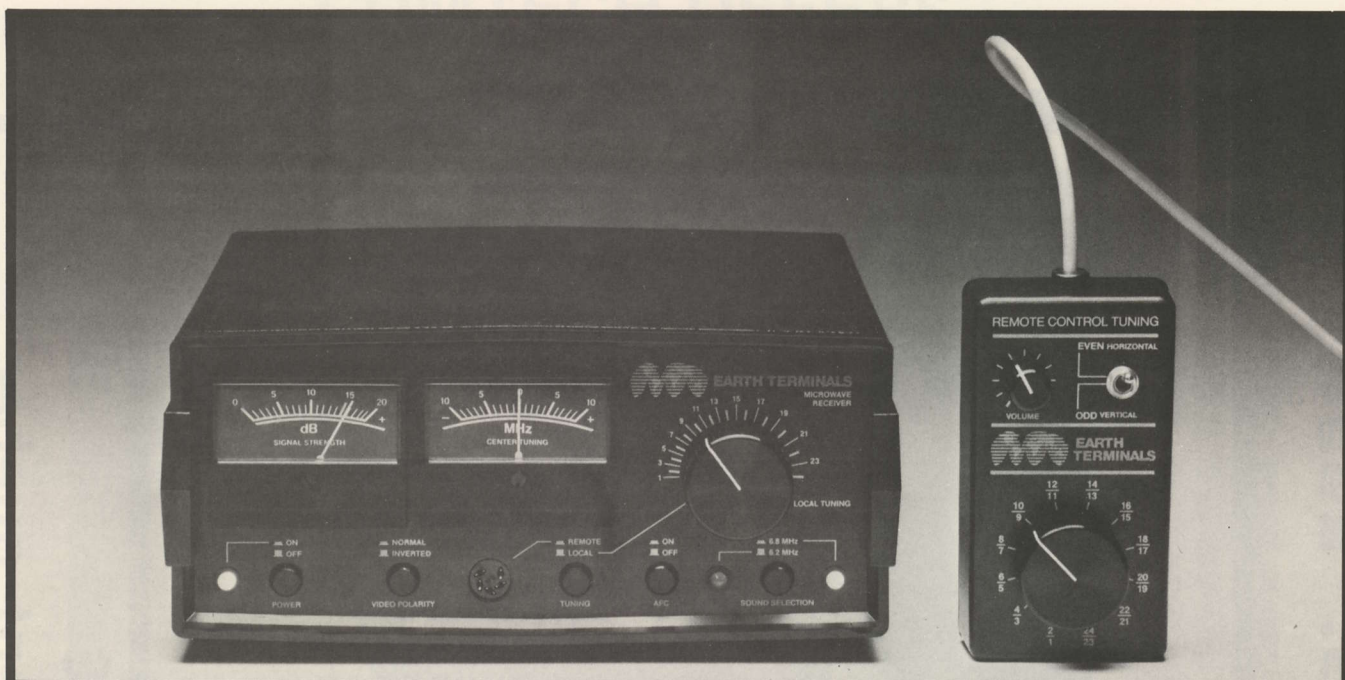
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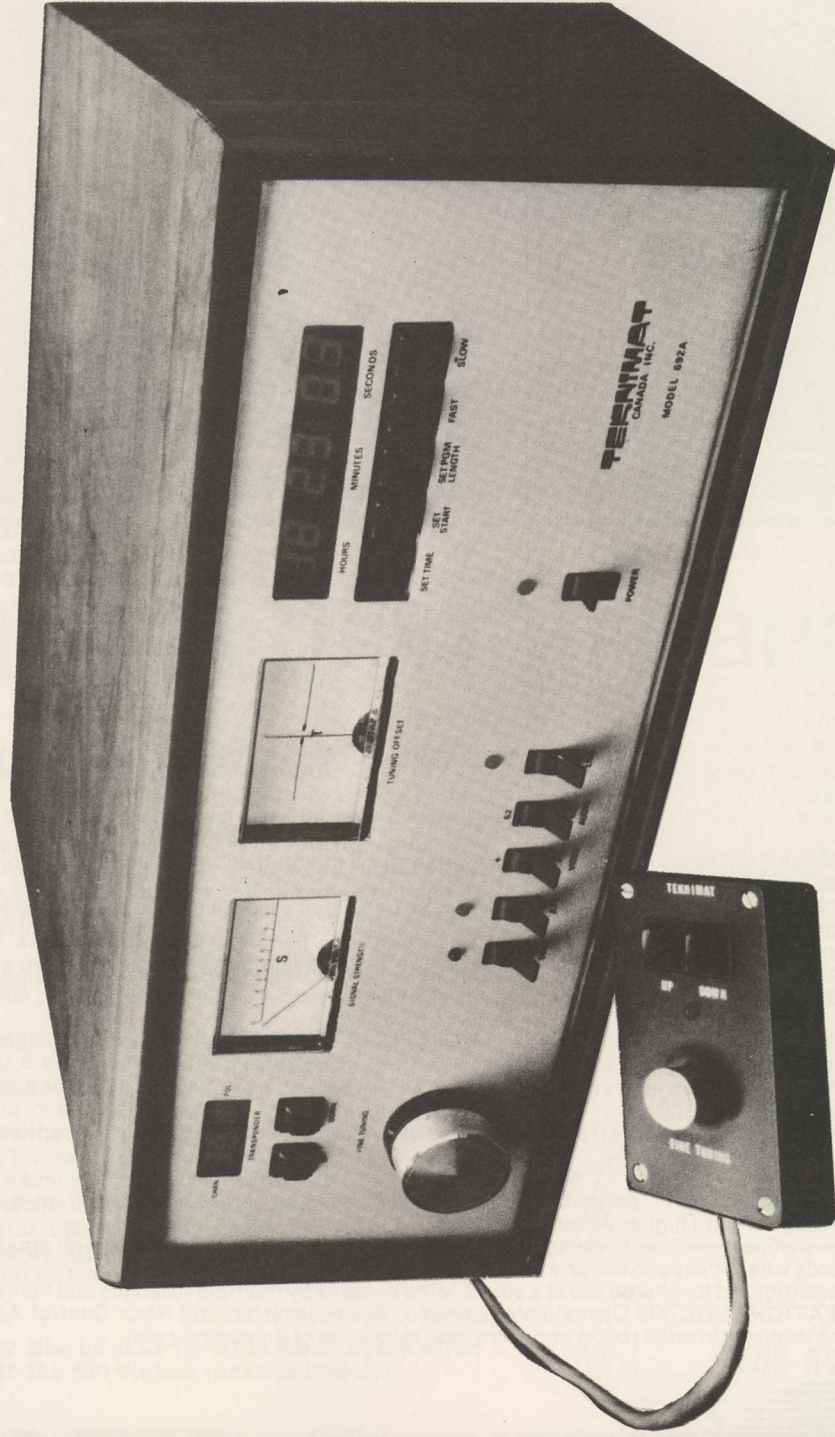


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We also feature a fully equipped and staffed service department reachable by our 800-634-6047 toll free number to promptly handle any requirements you may have.

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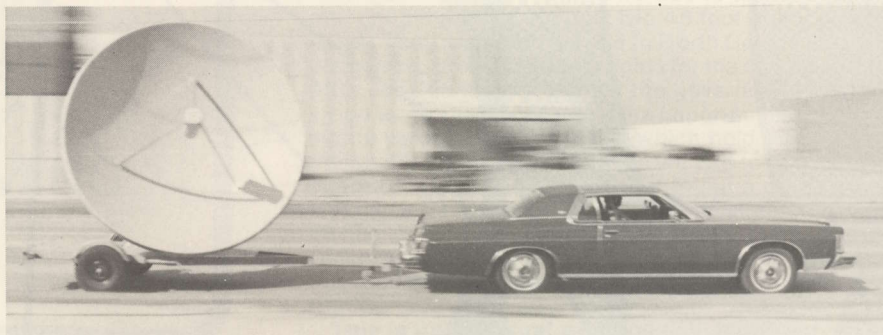
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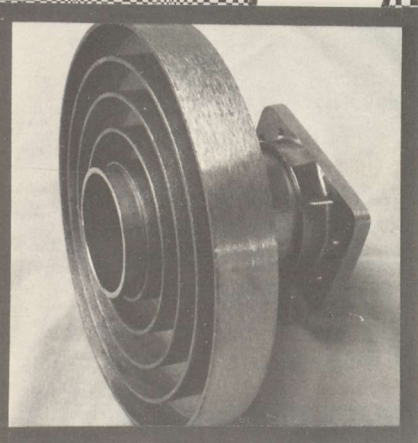
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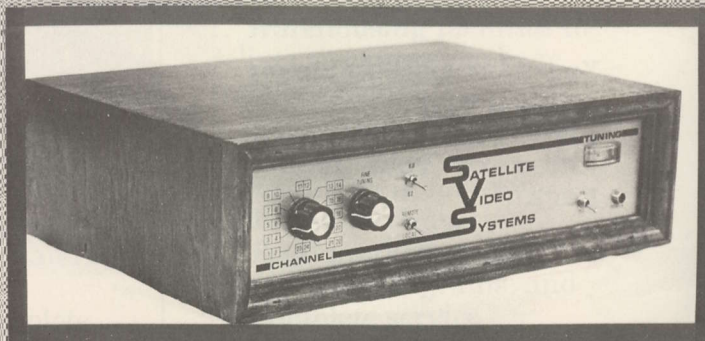
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Enter into the world of the 21st Century television with the SatFinder satellite system. The unique controls and easy operation makes the SatFinder the most INCREDIBLE earth station designed.



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**SATELLITE
VIDEO
SYSTEMS**

THE
LEADER
IN

COOP'S COMMENT ON PROGRAMMING

PUSHING HARD(er)

Although this is the 'show issue' for our Washington SPTS to be held April 17-19, we are spending precious little time in this issue talking about the forthcoming show. Rather a good portion of this issue is devoted to the emerging marketplace in the Caribbean, Central and (northern) South America for TVRO terminal equipment.

Since I happen to live in an area that is involved in this report I have some first hand personal experience on this matter. That makes me no more qualified to write about it perhaps than others but at least the perspective you will get from this issue is from one who is inside of the area of concern.

Since Susan, the kids and I moved to the Turks and Caicos Islands last summer we have been beseiged by well meaning people from throughout the Caribbean who believe we know some 'secrets' about getting US television down here. Because we receive it they figure they can also. The truth is that the obstacles to bringing this technology outside of the United States are often more mechanical than electrical.

Generally speaking anything that costs one dollar in the United States will end up costing you two dollars here. And it might go higher than that. Getting goods and materials moved from island to island is a big, expensive problem. We recently expanded (using a translator) Provo television service to the island of North Caicos. This is around 20 air miles from Provo but it might as well be several hundred since no boats ply the two islands and to haul the TV gear into North Caicos we loaded up a Cessna 170 with load after load of yagi antennas, cable, pipe, antenna masts, batteries and what have you. Before I made a final decision on the antenna system for North Caicos I strapped a channel 4 dipole across the windshield of the 170 and for two hours we flew 'patterns over North Caicos' plotting our signal coverage there. After we spotted a likely location we transferred to a four wheel pickup truck and drove over a roadless section of land to

arrive atop a small bluff that had a clear shot at our Provo transmitter some 21.7 miles away.

To get the site installed we had to talk the government into donating to us the only two 45 foot utility poles on the island. They had been barged to North Caicos after a year of planning to provide outdoor lights for the school sports court. After considering my request the government decided television for North Caicos was more important than lights for the sports yard. To get the poles (which hold the receiving and transmitting antennas) installed we had to talk a local resort operator into providing a D8 Cat to cut a road to the ridge, clear an area for the pole-tower and equipment housing and lift the poles into place. Some twenty residents of North Caicos volunteered a weekend to create the pole-tower, cut the road and get the site ready for me to install the electronics.

This is not unusual perhaps until you realize that North Caicos has **no electrical power**; only the scattered generator or two. But a local merchant already has orders for more than 100 **battery operated** black and white TV receivers on file so you can see that where there is a will, there is a way.

All of this is small time stuff. None of it would have happened without satellite delivery of programming. And none of it is happening inexpensively; despite donated labor and some raw materials.

If you are preparing to deal with taking American low-cost satellite television technology into rural, out of the way spots on this globe, my advice to you is to be totally prepared **before** you leave home. You should have spares of everything with you and even the simplest things like nuts and bolts must be brought to the job site by you from the states.

I have one more piece of advice; learned the hard way. People in remote areas such as this do not know the meaning of "cannot do". Any challenge is answered with "no problem". I foolishly believed "no problem" for several months; until things started coming apart at the seams. I have seen a native technician dig into a complicated video tape deck sure for the world he knows what is wrong and how to fix it. Even though he never saw anything more complex than a audio cassette recorder previously. Hundreds of dollars and months later I finally got it back from the states; running. I've seen section-alized parabolics go together in record time only to discover after assembly that the whole dish was hopelessly warped.

People who live with little have no fear of complex technology. **They also have no skills to cope with it** although they will **try anything** sure they will succeed. If you are going to be working in this environment I suggest you leave nothing to chance; never believe that anything is "no problem" and build into your sales and installation program plenty of safeguards and check points to correct mistakes before they get out of hand and cannot be corrected. If you keep your wits about you the huge market to the south will reward you. If you are sloppy in planning or execution you are headed for a very uncomfortable disaster!

CSD

PROGRAMMING



COOP'S SATELLITE DIGEST (Programming Section) is published monthly by Robert B. and Susan T. Cooper doing business as Satellite Television Technology (STT). Editorial offices located at West Indies Video, Grace Bay, Providenciales, Turks & Caicos, BWI. Communication with business office is through Business office at P. O. Box G, Arcadia, OK 73007 (405-396-2574); Rick Schneringer, Manager. Photography, Kevin Paul Cooper; editorial assistance Tasha Anne Cooper. STT produces various manuals, videotapes, guides and texts plus conducts the twice annual SPTS and once-annual SBOC events. STT is not affiliated with any manufacturer or distributor of satellite communications equipment. CSD subscription \$50 per year US / Canada / Mexico; \$75 elsewhere. Total contents copyright 1981 STT, USA & Turks and Caicos.

THE COMPLETE GUIDEBOOK TO OFF-SHORE TVRO RECEPTION

PLOWING SOUTH

Interest in American television 'south of the border' began shortly after the potential of satellite television became known in the general media/press. But results, based upon experience, has been slow in coming. During the past few months however significant results have been reported in a number of countries where the American television to now has been seen only on boot legged VHS and BETA tapes flown south daily from Miami, New Orleans and Houston. The importance of these new technological developments (i.e. hard results) is difficult to assess because of the lack of understanding most US programming sources and satellite hardware suppliers share in this region of the world. In this report **CSD** attempts to put the pieces together; not so much for our readers 'south of the border' but more for those **north** of the border who can be expected to be dealing with these potential viewers in the months ahead.

North American viewers take television largely for granted. More than 90% of Americans had access to off-the-air television by the mid 50's and the growth since then has been largely in program (i.e. channel) selection. This is not the case today in many nearby land areas where still substantial numbers of people live without television; or the television they have is slanted at propaganda purposes rather than 'pure' information (i.e. news) and entertainment or cultural enrichment.

In many nearby Caribbean, Central and South American nations television is either missing or state controlled. Television, as a medium for pure entertainment and information for **all** classes of people, is virtually unknown in the region; Mexico being a notable exception. Where entertainment/information television is **permitted**, it is often closely controlled by 'the state' or treated as a 'commodity' to be awarded under close supervision to a favored citizen or company.

In a nutshell, television as we know it is 'foreign' to these areas. It is therefore treated as a forbidden fruit, a status symbol, or a tool to be used only with permission of the governing powers.

With the advent of jet air transportation American television has infiltrated these areas; for those few with the money to pay the price. Some of the Central American and (northern) South American economies have a surprising number of people who can afford (and are willing to pay) upwards of \$75 per month just to have access to 'recent' video tapes originating in the USA. The commercial streets of Bogota (Columbia) for example are lined with little shops housing 'video tape clubs'. The customer pays an entry fee (equivalent to say a dozen blank VCR tapes) and then for a monthly fee in the \$100 range has access to **two** new four hour tapes **per week**. The tapes are multiple generation copies made in Miami or New Orleans or Houston, off of American TV, from the local HBO/SHOWTIME MDS system or even off of cable or satellite. Each week there are new tapes available and after paying

the entry fee, \$100 or so per month and otherwise qualifying the customer can select two new tapes per week after he returns the tapes from the prior week.

Video tape clubs are very common in Venezuela, Columbia, Panama and are catching on fast in Belize, Costa Rica, Guatamala and elsewhere. Since anyone with a 'contact' in the USA can acquire raw tape products overnight via jet from the states there is fierce competition for customers. The South American tape club operators stay competitive not by discounting but rather by offering very fast service and by constantly staying on top of USA programming trends. Interviews in Bogota indicate it is not uncommon for people with VCR machines to belong to several tape clubs at the same time; they select their clubs based upon the tape-program selections each offers.

The tape club operators have discovered the satellite connection possibilities. Today they depend upon maintaining relations with a USA contact that provides the off-USA television fare plus a string of contacts with cooperative airline stewards and stewardesses who are willing (for a fee) to shove a couple of ½ inch VCR tape 'masters' into their luggage. Flight attendant luggage gets very little inspection at most airports and when they are inspected a 'harmless' container of videotape is not what the inspector is looking for anyhow.

Numbers. How many people are playing this game? Studies in six cities in northern cities in South America revealed in excess of 125 'tape clubs' operating. Since the investment is small (proper contacts plus perhaps a half dozen ½ inch VCR machines to make dubs) and the rewards potentially great (it goes without saying the tape club operators are not paying anyone for the programming rights; legally they are 'pirates') the field is attracting more and more 'business entrepreneurs'.

Most of the tape clubs serve no more than 100 regular 'club members'. Less you pine for their volume that still approaches \$10,000 per month for a store front and some VCR machines. A recent trend has been the merger of competitive 'clubs' and the upgrading of equipment and contracts. Several of the clubs now boast more than 1,000 members and one with a chain of outlets strung through a half dozen countries claims to have 10,000 members. That works out to a cool million per month in sales.

As best we could determine the first 'tape club' to set up **its own satellite terminal** went into operation just after the first of the year in Belize (see **CSD** for March 1981). Belize is, by all standards, a 'small' market and the reported investment of \$50,000 American (\$100,000 in Belize dollars) is presently serving perhaps 150 club member customers. The money to afford an investment of super terminal for off-satellite reception of USA signals is available none the less. In trade for the cost of the terminal the tape club operator is able to eliminate his USA contact(s), and the cost of transporting tape masters in airline employee flight bags. More important however is the plus of having instant (rather than days delayed) access to a whole bird full of services. Remember - competition in this game manifests itself by infighting for more rapid access to programs the competition does not have available. The bird(s) is (are) the ultimate source machine(s).

It would be unfair to blanket indict all or even a sizeable percentage of the tape club operators by pointing out that it is a particular type of South American products which has created the money (USA dollars largely) that makes this whole system work. Still there are some obvious connections between those who have money invested in the South American drug trade and those who are selling USA television to the areas to the south. One US installing distributor of satellite hardware recently told **CSD** "If you were to inspect my list of customers who have bought big ticket home terminals, here in this area, and then compared that list to the

TVRO TEMPERATURE-STABILITY PROBLEMS?

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The heater circuit is floating so that currents will not affect system ground voltages. The WJ-331240-001 is protected against reverse voltages up to 50Vdc.

In quantities of 1-4, they sell for \$68 each; or, in larger quantities, 250-999, a \$47 price tag means sizable savings.* Deliveries are typically from stock. Package size for the DC heater is .760 x .510 x .180 inches (1.93 x 1.29 x .457 cm).

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Rain?

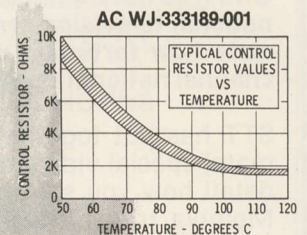
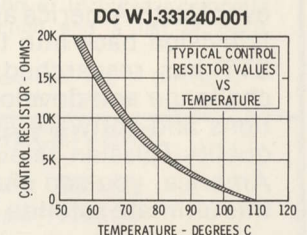
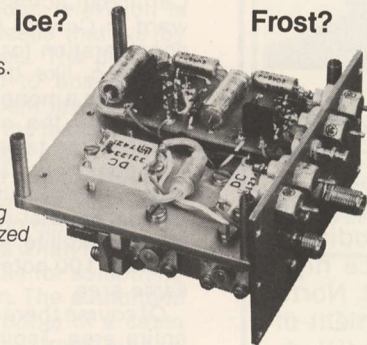
Cold?

Snow?

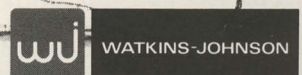
Ice?

Frost?

Typical DC Heater application showing temperature-stabilized electronic circuitry.



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local drug enforcement agency list of suspected big time drug dealers I would not be surprised to learn that the two lists were almost identical'. This particular installing distributor sells very fancy terminals (\$30,000 up) with several receivers per installation. Recently his ability to please customers in this area has put him into contact with potential buyers much further south. And they are talking big numbers.

Bob Behar of Hero Communications **agrees** with the analysis that it may be better not to ask too many questions when you are talking with a prospective buyer from the 'deep' south. "I had one buyer tell me that the price was unimportant; he wanted his children to be able to watch Sesame Street and other programs they saw when he brought them to the states. He was so far south in South America that we are probably talking about a 15 meter dish with 20 degree cooled parametric LNAs. I can't see this installation happening for less than \$500,000". Did the customer re-consider his 'price is unimportant' statement when he heard that number?

"He smiled when I gave him that number and then said 'If it works properly I want to give a dozen of them, just like mine, to some of my rancher friends around me; they have children also'."

Obviously there is a limit to 'price is unimportant' buyers. Generously, there are probably fewer than one hundred 'potentials' spread from the Leewind Islands in the eastern Caribbean across northern South America and then northward in Central America. Price is **also** not too much of a consideration for those who are in the tape club business; and who, like the pioneer installation in Belize, see the system as a money making machine. Where the 'rancher' may look upon the cost as a worthwhile 'investment' for his children, the tape club operator is going to be more bottom line conscious. He will, one assumes, weigh his present program 'acquisition' costs and his present program 'selection' against his savings, plus expansion he can expect with a satellite terminal. Again, generously, there may be another 100 potential such installations spread through the same area.

Of course there are many unresolved legal questions in this entire area. Taping (in the US) and transporting television 'south' for sale is clearly illegal; on the US end. But the **actual** sale takes place in another country, where it may or may not be illegal. Airline passengers departing Miami (for example) for Columbia may have a dozen pre-recorded tapes in their luggage. They may have bought tapes through legal outlets and the tapes may violate no laws anywhere. The inspection is not on the US end; it is at customs in the south. Even if the customs man is sincere in trying to crack down on bootleg tapes (so far no such pressure has surfaced) how is he to know what is really on the tape he removes from the container? Even if the label says the tape contains a legal dub of an old movie how do you know it does not have four or six hours of the last night's HBO programs; taken off cable in Houston?

There are of course international conventions protecting copyrights. We'll look at some of this elsewhere in this report. The bottom line is far simpler than the presence of the various treaties:

Without the constant effort and surveillance of local authorities in each country, such treaties/laws are virtually unenforceable.

The Rich and The Poor

With a few notable exceptions the demographics of most of the countries in the region is classic. There is a small, monied, influential upper class, a only slightly larger bureaucratic/shop keeper middle class and then 'the masses'. The top of the ladder crowd usually controls, directly or indirectly, the creation of laws and the implementation of the laws. This is another way of saying that if television programs from the states bends a few laws, enforcement of those laws is not

going to happen if that enforcement deprives the influential of their USA television. It is just that simple. Remember - enforcement, if there is any, must be on the **distribution** end.

Since these influentials have the money and power to get what they want, and the 'class' to do it quietly without creating much fuss it should not surprise you to learn that they are not the problem here. It is the up and coming middle class, knowing about the availability of USA television, that wants into the action. The customs inspector is one of the middle people. He has no sums of money but he sees the tapes arriving by the bag full. He knows what they have on them and he aspires to share in that 'wealth'. Sooner or later he puts the pressure on somebody hauling stuff in and in short order he has his own VCR at home. His friend, the water inspector, sees the machine and tapes in the custom inspector's home. He wants one and after awhile he finds a soft spot in the under bell of some tape importer, and pretty soon he too has a home VCR.

It takes not one or a handful or a few dozen people to plant and harvest and process and then ship the thousands of tons of Marijuana that leaves Columbia annually bound for the USA. It takes thousands. And they all make (by local standards) excellent money by being a part of the 'game'. They spend that money on things like VCRs and by getting 'in with' someone who has access to recent USA television programs.

In many of these countries, rich and poor, television is treated as a narcotic for the poor; those 'masses' that live (by US standards) well below the poverty levels. The program content is controlled and it is designed to ensure that aspirations of the masses stay at 'management' levels. In still other countries, such as Haiti, television for the masses is not even to the narcotic level; it is pure and simple a tool created by the state to perpetuate the state and the regime. Russian television (as seen by satellite users on Molniya and Ghorizont) exemplifies this. Cuban television is no different.

Haiti is an example of how the state reacts when that small but powerful bureaucratic 'middle class' opts for something more narcotic than pure state run television. The authorities in Haiti **allow** the operation (in Port-Au-Prince) of a cable television system that brings taped programs from Canada, the USA and France. Subscribers to the system pay around \$7 per month (American) for two channels of taped programs and there are around 10,000 Port-Au-Prince homes connected to the nearly ten year old service. \$7 American may not sound like a lot of money (US cable rates are comparable) but when you consider the average income for all families in Port-Au-Prince is under \$200 per year; well, seven times 12 is \$84 so the cable service is out of reach for 'the masses'. In effect the price, like it does in all things in life, separates the 'haves' from the 'have nots'. The middle class gets its narcotic, the government keeps the middle class bureaucrats reasonably happy, and the masses get state run television shown in community centers on television receivers often provided by the government. Price and price alone keeps the masses from aspiring too highly because they saw something on television that excited them.

Of course it is not a perfect system. Haiti shares the island of Hispanola with the Dominican Republic where a more populist television policy prevails. The 'DR' speaks Spanish while Haiti speaks variations of French. DR television can be seen in many areas of Port-Au-Prince and while the masses may not understand the language (although they say one can learn from television!) they do understand the cartoons and the commercials for Coke and new cars.

Enter Satellites

Into all of this comes the US satellites. For the most part they are **not** bringing something **totally new** to the area; television is already there in most areas and where television transmitters have not been built television tapes are in the streams of commerce.

The satellite availability really only changes one thing; immediacy. Yes, it adds some diversity to those hung up on

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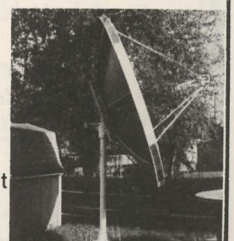
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single source tape clubs but it is the immediacy that dominates all of the other advantages of satellite service.

South Americans are sports fanatics. At all levels of income. This interest may be the one common thread that runs through the entire region. Take the fall '80 title fight with Holmes and Ali. Little Haiti, impoverished and decades (some say centuries) behind its neighbors put out \$15,000 to the fight promoters and INTELSAT to gain delivery of the title bout via satellite. It went on the state run TV system; a 'gift' to all of the country from the government.

South Americans have an intense interest in boxing, wrestling (even the hokey staged affairs on WTBS on Saturdays!), soccer and baseball. The annual World Series is reportedly the most widely distributed US programming of the year; any year. Countries such as the Dominican Republic and Venezuela that carry virtually no US programming at all on local terrestrial transmitters sign up years in advance for World Series feeds.

It will be sports and sporting coverage, available on SATCOM FI, WESTAR I and II and to a limited extent on COMSTAR D2 that will make the **big** difference in the establishment of extensive satellite receiving terminal systems throughout the region.

In those countries where uncensored news broadcasts are allowed, the immediacy of live satellite delivered newscasts will also play a role in the development of the regional market. But not as big a part as you might suspect. Even in those countries where terrestrial television systems are operating with few government restrictions news 'censorship' or 'control' is commonplace. This runs to what North Americans would consider extremes (Haiti) to mild censorship in countries such as Venezuela. Lacking constitutional guarantees and a history of 'free press' few of the nations involved are willing to place 100% control of hard news in the hands of business people. And there are no hard, fast rules to guide the businessmen bringing to the public reports of news events.

Haiti routinely assesses the impact of **all** news reports on its citizen masses, for example, automatically cutting out **any** reports from overseas of Haitian activities virtually regardless of content.

As some of the pioneers in the satellite field have already learned (the hard way) touting of 'live news reports' may have a reverse, negative effect on the proposed operation. There is a warning here; be sure of the ground rules in the country you are dealing with before you tick off a list of satellite service benefits. The 'TBS Evening News' on WTBS seems innocent enough when viewed by US standards; it may not be so palatable or desirable in the eyes of a government agency charged with the enforcement of local political doctrine.

The Legal Doctrine

There are 102 nations of the world who belong to INTELSAT; the international satellite organization. Each of these countries has agreed to respect INTELSAT regulations and one of the regulations reportedly states that satellite communications traffic/services between nations (i.e. **inter** as opposed to **intra**) shall be the exclusive domain of INTELSAT. In effect, by agreeing to this provision of INTELSAT, the member nations are guaranteeing to use their individual local policing powers to insure that INTELSAT maintains a **monopoly** on international (satellite) communications. If that is not clear, perhaps an example will help.

Venezuela is a member of INTELSAT. By this membership Venezuela is entitled to use INTELSAT satellite facilities to inter-connect the country's telephones, telegraph offices and television networks 'to the world' via INTELSAT. Venezuela pays its own way; the cost of its earth terminals associated with INTELSAT plus the charges for each use of the satellites. It happens that Venezuela/US message traffic (to include television) must go via a circuitous route that takes the messages far to the east of both the US and Venezuela to INTELSAT satellites parked over the eastern Atlantic. The traffic passes through INTELSAT terminals in the US, Ven-

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ezuela and the satellite itself. On the ground the Venezuela end inter-connects to the appropriate terrestrial system and in the US the INTELSAT people hand off the traffic to a US common carrier such as AT&T. **Each party handling the traffic extracts a fee for handling it.**

It also happens that the US 'domestic' satellite, COMSTAR, places a 30 dBw contour signal directly over much of Venezuela. And as we see in a companion report SATCOM FI and F2 place useable (estimated 25-26 dBw) signals over much of the country as well; at least on some transponders. It is **technically possible** for the same message to go directly from the Venezuela terminal to the US terminal without INTELSAT. Furthermore, because fewer 'carriers' are involved the cost per message unit delivered would be substantially lower. Based upon US tariffs, as much as 50% lower.

Hands are tied on both ends of the circuit however because both the US and Venezuela are prevented from dealing 'directly'. INTELSAT, as wonderful as it is, has served as a brake on the development of lower cost inter-national services.

AT&T is heavily involved with INTELSAT through its intertwined arrangements as a leasor of COMSTAR birds (owned by COMSAT and rented by AT&T / GT / E; COMSAT in turn is the official US 'representative' in INTELSAT). When attempts have been made to expand the intra-national services of say RCA SATCOM birds to neighboring countries, AT&T has been quick on the pen to file oppositions at the FCC.

There is a rich history of 'attempts' to expand the international service operations of SATCOM and WESTAR, dating back into the mid 70's. And while our examination here is of the areas south of the US, similar problems arise when one wishes to expand US (satellite television) services **legally** into Canada. Canada is instructive, even key, to understanding the legal limitations for the areas to the south however since the Canadian 'experience' began much earlier than southern interest.

Efforts to gain legal permission to serve (say) Canada with SATCOM signals began as early as 1976; shortly after SATCOM began delivering HBO programs. COMSAT opposed the applications from the outset, arguing on behalf of INTELSAT, making the point that INTELSAT (COMSAT) and only INTELSAT (COMSAT) was authorized by Congress in May of 1962 to provide 'international satellite communications'. A study of the floor debate, in Congress, that was behind establishment of the communications Satellite Act of 1962 suggests this is not the case at all. The Congressional Record for May 1, 1962 reports Congressman Harris reporting to the floor on the result of the House Foreign and Interstate Committee's study of the proposed act. The Congressman summed up the report by noting:

"It was agreed that it was not the intent of the Congress by (this) Act to preclude the creation of an additional communications (satellite) system or systems...."

Further study of the floor and committee debate finds these phrases buried in the text:

"Section 305 (a) grants to COMSAT the authority to '(1) plan, initiate, construct, own, manage and operate...a commercial communications satellite system'. As first introduced this section referred to systems. This was changed to the singular by the Senate. This deliberate action and the Act's dominant use of the term system in lieu of systems indicates that the Act only intend(s) that COMSAT be given control over the single system contemplated."

An opinion from the US Attorney General dated November 1971 expanded further on this by noting:

"Since the Act did foresee the eventual creation of additional systems but did not vest their control (solely) in COMSAT, the subsequent creation of new controlling entities cannot be said to have been precluded by the Act".

The same legal opinion also notes:

"...there is clear evidence of legislative intent that

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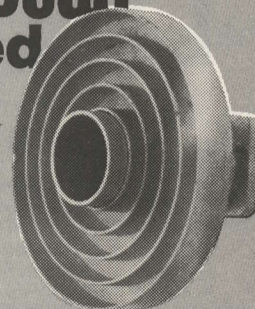
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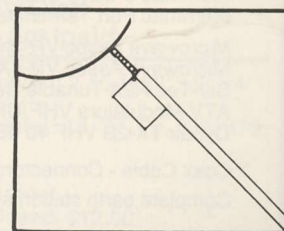
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complimentary or competing systems be legally permissible...".

INTELSAT came into being some two years after the 1962 Act was adopted by both Houses of Congress and signed into law by President Kennedy. An 'interim agreement', laying the ground work for INTELSAT has in its preamble language almost identical to that adopted in the Act; specifically, it notes:

"...[it is the desire of the nations] to establish a single global commercial communications satellite system..."

Significantly, the use of singular is the same as the 1962 Act. The Attorney General in 1971 concluded that the Act and the INTELSAT agreement must be taken together and that neither can be enforced or interpreted without the other. In the permanent agreement adopted in 1971 it states that INTELSAT shall provide public telecommunications "...and other specialized communications" only if they do not impair the ability of INTELSAT to achieve its prime objective(s).

The preamble to the 1962 Act really says it all:

"It is not the policy of Congress by this chapter...to preclude the creation of additional communications satellite systems, if required to meet the unique governmental needs or if otherwise required in the national interest..."

If the COMSAT position vis-a-vis international use of US authorized domestic satellites is so weak, why has COMSAT been able to keep such approvals from occurring at the FCC? The answer is unclear but the history of efforts in this area is not. Again, Canada provides illustrations but it also muddles the waters because Canada, like the US, also owns and operates its own 'domestic' satellites.

There was a fear, perhaps well founded, that Canada intended to inaugurate international use of its (then new) ANIK series of satellites; way back in 1972. During the fall of 1972 a series of letters were exchanged between Bertram W. Rein, Deputy Assistant Secretary for US Transportation and Communications, K. B. Williamson (Minister of the Canadian Embassy in Washington) and F. G. Nixon, Administrator for the Telecommunications Management Bureau for the Canadian Department of Communications.

In a November 6th (1972) letter to Mr. Rein, Minister Williamson noted:

"It is Telesat Canada's intention...to provide satellite communications largely within Canada but also to certain points in the United States..."

Williamson also noted **"...the services provided to and between points outside of Canada would be incidental and peripheral to the main Canadian domestic service of the corporation. It is recognized that any service between USA points would be only where (there was a) insufficiency of USA domestic facilities. (It is assumed that) the US would agree to the application of the same principles in a reciprocal situation when (US) domestic satellite systems are in operation"**.

The US answer, initiated one day later by Bertram Rein, was blunt and to the point. Before we look at it we must recall that Canada was at this point in time about to launch ANIK. Or to be more precise, Canada was about to launch ANIK **with the assistance** of a US launch vehicle at Cape Kennedy. Rein wasted no more time reminding the Canadians that the US was in the "driver's seat". Rein wrote:

"...the United States commitment to provide launch services was for a domestic Canadian satellite system...[yet] you advise it is now intended that the objects of the Corporation under the TELESAT Act be amended to include authority to handle international traffic as well as the domestic traffic of other countries. (You) have indicated it is intended that satellites to be launched by the United States would be used to provide telecommunications service to and between locations outside of Canada..."

This plainly angered the US since they were (1) watching while Canada (not the US) put into orbit the first

domestic geo-stationary satellite system, and (2) were providing the launch facilities for that system. Rein continued:

"Under these circumstances, we believe that the launch service to be furnished by the United States must be premised on your adherence to the following condition. Prior to the institution of any international public telecommunications service utilizing satellites launched (by the US) pursuant to the (US/Canada) 1969 understanding, the Canadian authorities will submit the proposal (for international service) to the INTELSAT Assembly of Parties... (and) such service shall not be inaugurated unless:

(a) The proposal receives a favorable recommendation in the INTELSAT Assembly (for this purpose a favorable vote would be 2/3rds approval); or

(b) The proposal is supported by the United States Government."

By establishing these terms, only days before ANIK was due to lift off the pad, the US government was able to force the Canadians to back off their plans to internationalize the ANIK domestic birds. Having notified the Canadians that the launch could be stopped, the US then established three special circumstances where Canadian satellites might be used for US service; and vice versa (when the US birds were operational). They went (and remain today) as follows:

1) **Catastrophic failure** - in the event a bird died on either side, subject to the availability of transponders on the 'other side', both nations would agree to provide backup assistance to the other.

RCA today maintains an agreement with TELESAT wherein up to 11 ANIK transponders could be pressed into emergency service for RCA SATCOM traffic should a SATCOM bird 'die'.

2) **Shortage of facilities** - in the event one nation was experiencing a shortage of transponder space it was agreed it would be possible for the other to assist on a temporary basis.

3) **Incidental and peripheral** - where it could be shown that what was obviously a domestic service on either side (i.e. WTBS as distributed in the USA) could be extended to the other side when such extension was obviously 'incidental and peripheral' to the (primary) purpose that service was available within a country, the frame work was established for extending such services to the other side.

That sounds like an open invitation for a US domestic carrier, such as SSS, to extend WTBS to Canada. It is not as we shall see. In the Rein letter he notes "...implementation for services of this type will be subject to approval by appropriate representatives of both governments..."

Rein closed his letter of November 7th with the urging "We would appreciate receiving confirmation that you share the views expressed herein and that this exchange of letters constitutes an 'intergovernmental arrangement'." A response dated November 8th from Williamson was short and sweet.

"We hereby confirm that your letter of November 6th, your letter of November 7th, and this reply constitute an 'intergovernmental arrangement'."

And so the short lived Canadian effort to turn ANIK into a more-than-domestic bird was shot down; only days before ANIK was launched with US rocket power. It was not the end of the matter however since many entrepreneurs would in later years read the 'incidental and peripheral' phrase and from that see a ray of hope that US domestic services could be legally extended to Canada.

In April of 1977 a Mr. George T. Chandler of Sunriver, Oregon directed a letter to the Federal Communications Commission. Mr. Chandler asked whether he could install a satellite receiving system to pick up Canadian ANIK programs in Sunriver. Charles R. Cowan, Chief of Facilities and Services Division speaking for the Common Carrier Bureau

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responded:

"Unlike the reception of broadcast programming, the reception of signals transmitted via ANIK satellites is subject to the United States/Canada Intergovernmental arrangement of 1972, and to the provisions of Section 605 of the Communications Act. The (1972) arrangement recognizes that ANIK is a domestic satellite system intended for use solely within Canada. However, service(s) may be extended to a point or points in the United States where such service is incidental and peripheral to the provision of service that is clearly a Canadian domestic service. The reception of (CBC television) programming in the United States may fall within this category. However you should be aware that implementation of any incidental use of ANIK in the United States is subject to the approval of representatives of the United States and Canada."

In spite of this negative 'party line' RCA and Southern Satellite Systems, Inc. sought to break the logjam in mid-1977. Southern and RCA filed formal applications at the FCC requesting permission to extend (then) WTCG television service to cable television receiving sites in Dryden, Ontario and Sydney, Nova Scotia (in particular) as well as other (unspecified) sites throughout 'lower Canada'.

COMSAT lost no time in filing an objection; in August of 1977. In their pleading COMSAT stated:

"Southern's application is not simply a request to add additional points to an already existing domestic service offering. Rather it is an application that, if approved, would drastically alter the way international communications are currently provided pursuant to Commission policy, US law, and international agreements to which the US is a party".

Then COMSAT let it all hang out:

"In essence Southern is seeking authority to establish a

competitive alternative to the INTELSAT system for the carriage of 'international public telecommunications' and, in view of the commitment made by the US to support the **single** global satellite system, the Commission should not countenance it..."

We added the emphasis to the word **single**. Recall if you will that we have already seen, in the legislative history of the 1962 Act creating COMSAT (and therein after INTELSAT) that our Congress never intended for there to be a 'single' anything. You cannot blame COMSAT for trying; if you wish you can blame the Commission for buying the argument however.

Having stuck in the world 'single' early in their opposition to the Southern application COMSAT bore down.

"...COMSAT is specifically and **exclusively authorized** (this time the emphasis is theirs) by...the Satellite Act...to provide for the transmission of all commercial satellite traffic between the US and international points. Accordingly, as a matter of law, US carriers have no alternative but to come to COMSAT when they desire to make use of a satellite system for the transmission of US traffic to foreign points..."

COMSAT also dug around and found a copy of the now infamous intergovernmental arrangement'. It pointed out to the Commission:

"Certainly it would not be in the best interests of the US to elicit promises from others (i.e. ANIK should not be used in the US) inconsistent with the position it might take itself. (Furthermore) allowing a US domestic system to provide international services to Canada implies that a Canadian domestic system would also be permitted to provide such services to the US; in competition with INTELSAT".

In a well researched and carefully documented response to COMSAT, Southern's Counsel Robert F. Corazzini tried his best to show that COMSAT was not entitled to be 'a party to

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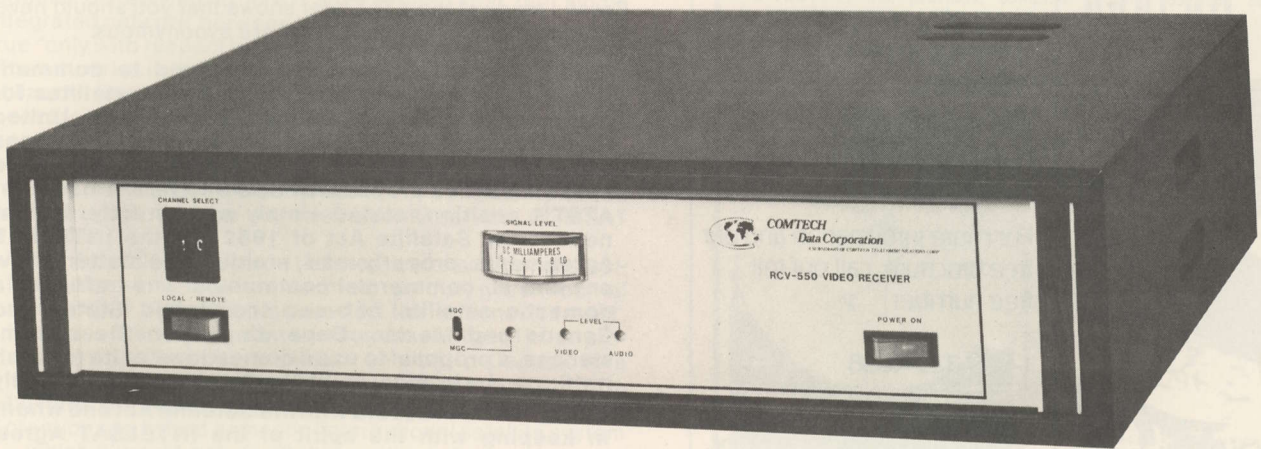
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the preceding'. He missed one crucial bit of evidence; the text of the legislative history creating COMSAT back in 1962, and, the Attorney General's opinion of 1971 (cited here). The Commission, not able to handle the situation, stuck the whole file into a folder where it rests today.

Well, that is not quite true. Early in 1978, February to be exact, Southern tried to drag the Canadian application out of the folder. The Motion Picture Association of America (fearful that Canadian distribution of WTCG would dilute the market for their products in Canada) and COMSAT filed against; again. But there was a surprising legal brief filed by AT&T. Careful study of the AT&T brief shows that you should never assume that AT&T and COMSAT are synonymous.

"AT&T believes it is now constrained to comment briefly on the issue of use of domestic satellites for commercial communications between the United States and other North American countries. AT&T does not in these comments either oppose or support the specific service proposal of SSS and RCA Americom. AT&T's position, stated simply and directly, is that neither the Satellite Act of 1962 nor the INTELSAT Agreements, properly read, prohibit as a matter of law any and all commercial communications traffic via a domestic satellite between the United States and Canada and Mexico. Depending upon the circumstances, a proposal to use a domestic satellite for such traffic can be in accord with the Satellite Act and wholly traffic can be in accord with the Satellite Act and wholly in keeping with the spirit of the INTELSAT Agreements."

Well now, that is straight forward enough. Somebody had obviously done their legal homework! Let's see how AT&T attorneys arrived at this position.

"(Historically) communications on the North American continent has been provided by carriers of all three countries without any significant regard to international boundaries...(There) has been a recognized 'community of interest' between these countries by virtue of geographic proximity. Changing technology has not altered that perception of community interest. Satellite communications is simply another effective modern tool with which to promote economical unburdened communications on the North American continent."

Recall that the US, in putting a stop to Canadian ANIK plans for international service in 1971, told the Canadians that one way for ANIK to become an 'international' service was for the Canadians to take their plans to the Assembly of Parties (through the INTELSAT Board of Governors). The US also told Canada that if the Assembly approved (in this instance) by a 2/3rds vote the Canadian plan, the US would accept the use of ANIK for delivery of services within the US. AT&T told the Commission in their 1978 filing that **"...the Assembly of Parties...shall express...in the form of recommendations... its findings..."**. No place, in article XIV (d) of the INTELSAT Agreements does it apparently say that the Assembly must approve (by 2/3rds vote or any other vote) the plan. It does state, according to AT&T, that they want to ensure technical compatibility, wise use of the orbit space spectrum and to try to avoid "significant economic harm to the global system of INTELSAT".

COMSAT would of course like the Commission to believe that their rights to exclusive international service preclude anyone else from providing that service; even when COMSAT-INTELSAT are unable (technically or economically) to provide an identical or similar service. We'll address that question shortly.

AT&T concludes their filing by noting:

"...the use of domestic satellites to provide communications service between the countries of the North American continent is not automatically precluded as a matter of law or international agreement (as claimed by



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Motorola MWA 120	400MHz, 14db gain, +8dbm	9.75
Motorola MWA 220	600MHz, 10db gain, +10.5dbm	12.40
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Motorola MWA 320	1GHz, 8db gain, +11.5dbm	13.50
Motorola BFR 90	3GHz FET NPN transistor, 15db gain @ 1.2GHz	2.50
Motorola MRF 901	3GHz FET NPN like BFR-90 but 2 emitter leads	2.75
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COMSAT and MPAA). Any blanket endorsement by the Commission of COMSAT's extreme position on this issue in deciding the SSS and RCA Americom applications would be in error and contrary to the clear intent of the Communications Satellite Act of 1962 and the (subsequent) INTELSAT agreements. (A) threshold rejection of every proposal on the rationale put forth by COMSAT would be erroneous and contrary to the best interests of the United States and the communications consumer..."

Did COMSAT roll over? Not quite. They went through the motions of replying to AT&T. They argued that the 'single integrated network' between the US, Canada and Mexico was true "only with respect to terrestrial facilities" and they added "The countries in the North American network have chosen to utilize the facilities of the single INTELSAT 'global network' to meet their international public telecommunications requirements".

AT&T did force COMSAT to respond to the apparent fact that they did not have the authorization of Congress to be the 'sole satellite service' for international service. COMSAT responded:

"...the Act did not preclude the creation of additional satellite systems 'if required to meet unique governmental needs or if otherwise required in the national interest'. However there has been no suggestion that (1) the provision of commercial television service to Canada is a 'unique governmental need' -- which of course it is not, or, (2) that the 'national interest' would be served by the creation of a hybrid domestic/international satellite system -- which it would not; or (3) that such a hybrid system was ever intended by Congress".

And so back in 1977 and 78 we had a war of words. COMSAT arguing that they and **they alone** were entitled to provide singular international service, RCA, SSS and others arguing that COMSAT was not supposed to be the sole source of anything.

Today, more than three years later, the Canadian question remains unresolved - at least legally. In the interim of course more than a thousand private terminals have sprung up throughout Canada receiving not only WTCG/WTBS but the full range of services from SATCOM FI (and others). Clearly the Commission had the **opportunity** in 1977-78 to create policy in this area which could have been followed legally by all parties. It chose not to come to grips with the issue and lacking a policy other than the muddled aftermath of the 1972 'Intergovernmental Agreement' the private sector has moved forward while the public/government segment has left the matter alone.

Meanwhile To The South...

While our history lesson to date has largely dealt with the background for a lack of accord between the US and Canada, there have been similar efforts in the Caribbean. In this study we shall see that the 'interest' in providing reception services via US 'domestic' satellites has largely been a function of technology growth. Canada, for example, receives such a strong satellite footprint signal from most of the US birds (because of the need to cover Alaska southeast to Florida with Canada in between) that reasonably priced satellite receiving equipment was always available for this service. At least from 1977 or so onward. Further off boresight, where satellite footprints are weaker and larger antennas and more complex receiver systems are required, the interest in receiving the services has followed closely the development of lower priced hardware. This year, 1981, is likely to be 'the year' of satellite expansion in the Caribbean, northern South America and Central America.

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at sufficient locations, there is far more that **we do not know** than we do know about the characteristics in the region. Data is starting to come in however as a companion report as this issue indicates.

Grand Cayman Island, a tiny spot in the Caribbean some 200 miles or so south of Cuba has been the 'Canada of the south'. On the surface the island should not attract that much interest. Approximately 15,000 people live there. The island is one of a trio settled several hundred years ago by Scots and others from the British Isles plus a generous helping of migrants from southern US plantations after President Lincoln freed the slaves. Grand Cayman is best known in the financial world because it has an unusual tax and banking law base. Until it adopted laws allowing people or firms to open 'postal box banks' the islands averaged fewer than 10,000 tourists per year. Today it may run as high as that every two weeks. Thousands slide back and forth between Miami and Grand Caymen with brief cases loaded with cold, hard cash being hauled out of US bank inspector eyes. **There are more than 350 registered banks on this tiny island;** roughly one for every 40 fulltime residents! Some call it the Switzerland of the western hemisphere.

This Switzerland has no television. At all. The nearest stations are in Cuba and the next nearest are in Jamaica; some 300 miles away. A number of US firms have been attempting to get some type of television started there for nearly a decade. There is a brisk videotape business of course and motel/hotel complexes offer day-delayed TV as a regular feature.

Whiel still battling the FCC for permission to serve a pair of Canadian cable systems, Southern Satellite Systems asked the FCC on September 12, 1978 for permission to take WTBS/WTCG to Grand Cayman. SSS asked for authority to extend a 'presently authorized service to various new points of communications located throughout the Cayman Islands, British West Indies with service initially provided to Grand Cayman Island'.

SSS moved into the south after it received notification from an applicant for a cable television franchise for Grand Cayman that the local government **insisted** upon seeing some indication that the applicant could deliver the services it claimed. One of the claims was WTCG/WTBS. In effect, Cayman Transmission Video Systems, Ltd. was between a rock and hard place; if it could show it had the (legal) ability to bring in the Atlanta station, its application for a cable franchise 'might' be approved.

There was a learning curve resulting from the fiasco with Canada applications at work however. One of the multi-layered COMSAT protests noted that "if" the Canadian cable systems really wanted Atlanta television, COMSAT might be willing to provide it via INTELSAT. Of course the kicker was the price; never flatly stated but based upon COMSAT tariffs on file at the time amounting to around \$200 per home per month (!). SSS figured they had a new tool here and in the Grand Cayman application they cited their RCA SATCOM service as being "the only economically feasible means of providing live (Atlanta) independent television programming to the Cayman Islands".

COMSAT wasted no time opposing the Grand Cayman application. The protest was a replay of the Canadian opposition with one new twist. COMSAT pointed out that Grand Cayman was a Crown Colony of the United Kingdom, and the UK was a signatory to the INTELSAT agreement. In effect, according to COMSAT, Grand Cayman was 'spoken for' by the UK representative in INTELSAT; Cable and Wireless (West Indies) Ltd.

With COMSAT filing Cayman Transmission Video Systems then filed to state its own case. They noted:

"COMSAT's objection is premised on the motion that Cayman Transmission's request for service from Southern Satellite will somehow 'siphon off' business

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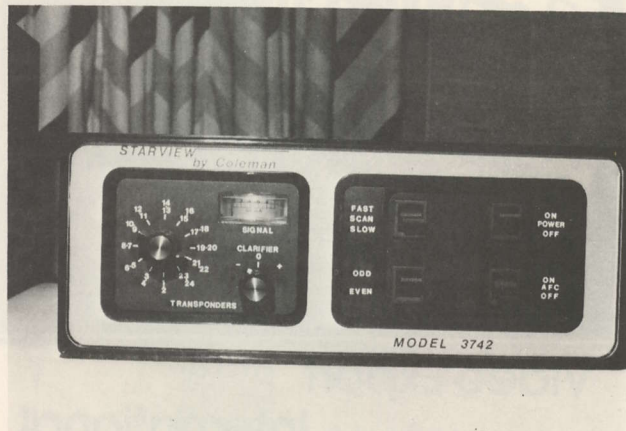
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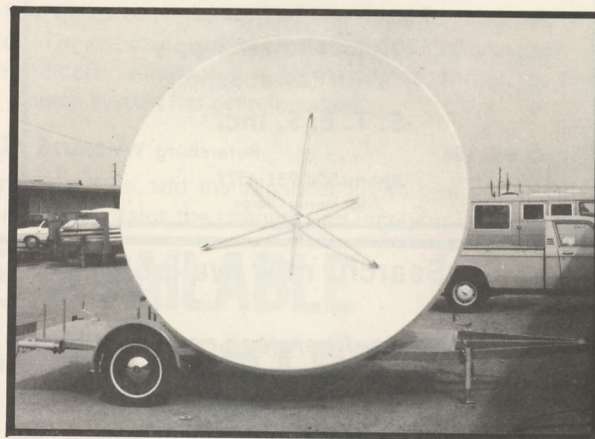
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from COMSAT and the INTELSAT network...(yet) there is no similar service available from COMSAT. To deny service...because of the extremely remote possibility that US television stations might, at some time in the distant future, become available for carriage on cable television systems via the INTELSAT network, serves no useful purpose and could not have been intended by the INTELSAT treaty."

They went on to point out that if such (INTELSAT) service ever did become available they would 'eagerly consider using it'. And then fearing a turn down, Cayman Transmission suggested a 'temporary or conditional authorization for immediate service until COMSAT or INTELSAT provides the same or similar service'.

Southern Satellite went on record with the now classic phrase "**The alternative to service by Southern Satellite is no service at all**". COMSAT was not moved by the emotion of the appeal. In its reply it noted:

"To the best of COMSAT's information Cayman Transmission has never even requested its correspondent Cable and Wireless (West Indies) Ltd. to provide it with access to the INTELSAT system. Should service be requested there is no reason to believe that it would not be promptly provided. Certainly there is no technical obstacle since INTELSAT satellites currently provide service to a number of similar international points including Jamaica, Haiti, the Dominican Republic, Martinique, Barbados and Trinidad. And, COMSAT is prepared to provide the requested service to the Cayman Islands as promptly as facilities can be made available."

The Grand Cayman matter dragged on into 1979 in the barely active folder at the Commission. In March of 1979 Southern Satellite amended its application for service noting that it now had a **pair** of applicants for service; in addition to Cayman Transmission Video Systems a new firm called Cayman Island Television also had asked for WTBS/WTCG service. The new applicant wanted to establish a low power TV station on Grand Cayman (as opposed to cable TV) and in a filing with the Commission late in April of 1979 CIT noted "**The service which Southern Satellite proposes to provide cannot be economically provided by INTELSAT; COMSAT does not offer any data to indicate it could provide television program transmission service to Grand Cayman on a basis which would be economically feasible**".

INTELSAT service rates (in the instant situation they would be several thousand times more expensive than Southern Satellite) are of course not designed on the same 'multi-point receiving basis' as US domestic bird rates. INTELSAT traditionally looks at sending one program from one uplink to a single downlink (receiving site). The charges reflect full use of a transponder (or half transponder) by a single entity on both ends of the line. With only a single customer (Grand Cayman in our example) receiving the relayed service the full cost of the service would have to be borne by that single receiving terminal. It is not dissimilar to Southern Satellite providing WTCG to a single cable system; rather than charging the cable systems the present 8-10 cents per home per month the single system would have to pay Southern for the full cost of the transponder rental (in excess of \$100,000 per month) plus Southern operational costs. Clearly a small country with 15,000 people could not afford that type of 'TV bill' per month.

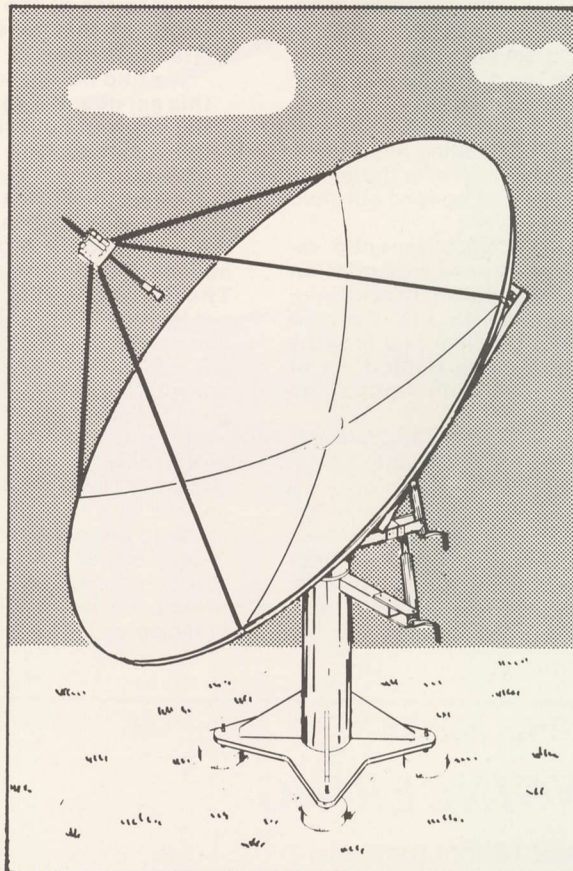
With the Commission on dead center on the Grand Cayman issue another outfit tried yet another tactic for the island nation. A San Francisco law firm wrote the Commission late in October of 1979:

"My client, a Panama Corporation, wishes to inquire about programming which could be obtained from United States non-common carrier program suppliers, such as Home Box Office, on a contractual basis. The

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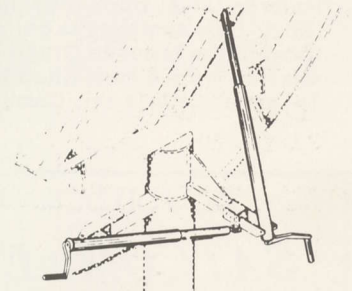
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receiving of signals transmitted via satellite raises the following question: Does the construction and operation of a receive-only satellite earth station located **outside of** the United States to receive (the) transmissions of a non-common carrier pay television program supplier over a private leased channel of the United States satellite transmission system, where my client has contracted for this programming on a fee basis, **require an FCC license?**"

The attorney was looking, it appeared, at establishing whether or not his client could make **independent** arrangements with a non-common-carrier pay programming supplier (HBO was cited as an example) to receive the programs outside of the US and never even tell the FCC about it?

A fourth Cayman Island firm was thinking along similar lines. This one, known as Cayman Broadcasting Associates, had in mind a subscription television operation for the island. They wrote the FCC in April of 1979 and spelled out their program:

"The Government of Cayman Islands recently requested that we pursue the possibility of a subscription television system. It has become apparent that obtaining permission to receive signals in the Cayman Islands directly (via US domestic satellite) is a lengthy and tenuous pursuit. Considering the objections of COMSAT and INTELSAT the pursuit would probably be fruitless.

In order to avoid a collision of interests with COMSAT and INTELSAT we are considering contracting with one or more common carriers to receive one or more satellite television signals within the boundaries of the United States. Upon receipt of the programs we would (video) tape same at the point of signal receipt and then forward the tapes to Grand Cayman for delayed transmission via a subscription television system".

To some surprise the Commission did answer and the

answers, composed by William Allen, Acting Chief of the International Division of the Common Carrier Bureau, are instructive to anyone concerned about this whole complex picture:

"You cite the difficulties involved in obtaining authority to utilize United States Domestic Satellites to provide service directly to the Cayman Islands. Instead you propose to contract with common carriers to receive one or more satellite television signals within the boundaries of the United States. You would tape the signal at that receiving site and forward the tape to Grand Cayman.

We find no legal or technical barriers to your providing this service. However we note that there may be potential copyright questions involved and we would expect the Cayman firm to comply with all applicable US statutes."

In effect the Commission has no quarrel with firms taping and sending on tapes, provided there are contracts between the tapper and the program supplier, and, provided no international or US copyright violations occur.

The Copyright Snafu

If the entanglements surrounding extending US domestic bird service outside of the boundaries of the US are confusing, copyright is a real can of worms. The premise behind copyright is clear enough. Someone creates an original work and to prevent others from stealing that work he registers it with the US Copyright Office. The same work can also be protected internationally on a country by country registration basis, or it can be protected outside of the US by relying upon nations who are signatories with the US in the international arena to protect their US based interests.

Of all of the trade associations, groups or others organized to protect copyright interests, the Motion Picture Association of America is the strongest. Through a well run, powerful Washington lobby they are constantly seeking out violations

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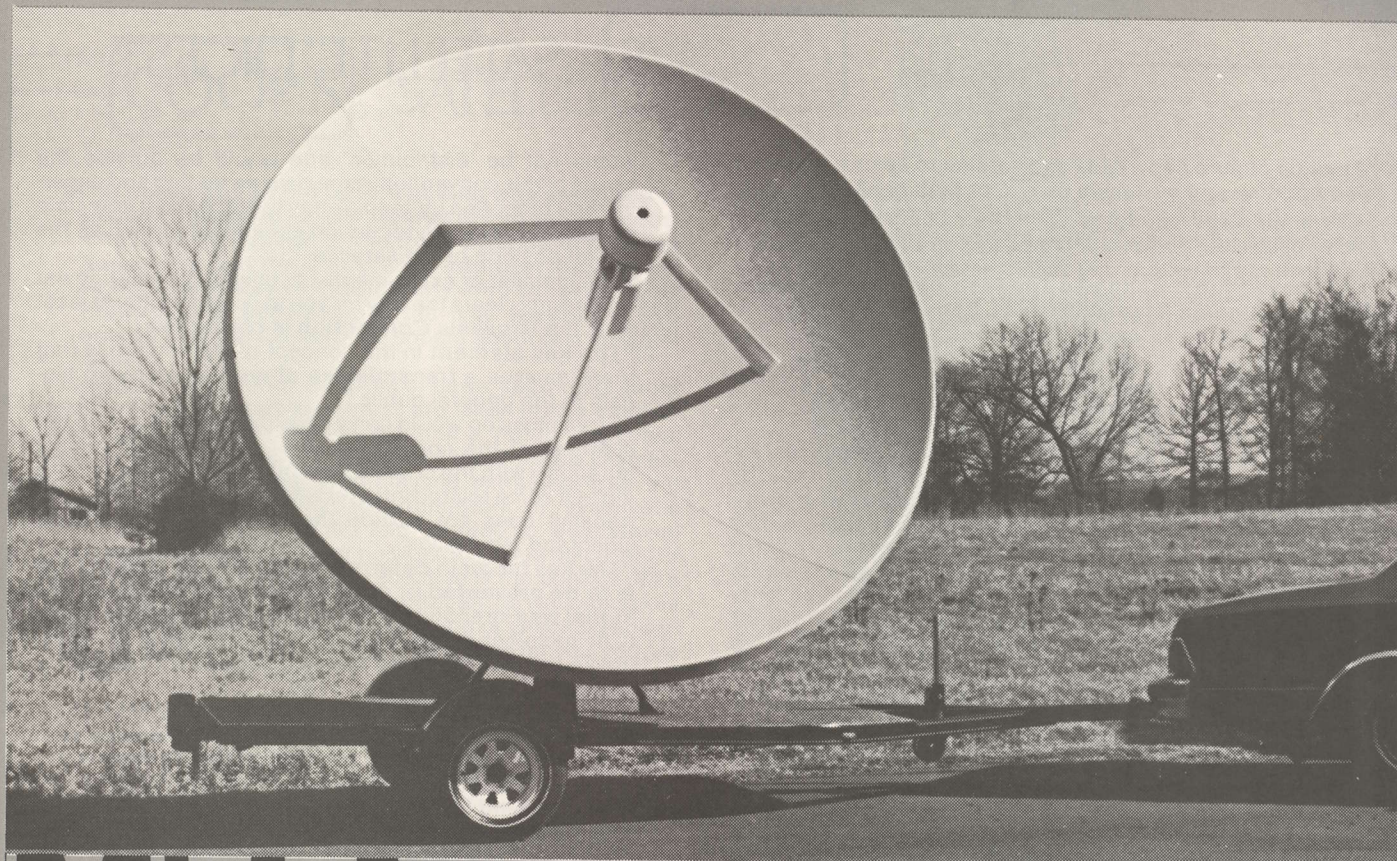
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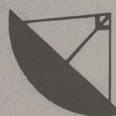
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of motion picture copyrights and battling to ensure that their member firms get maximum return for their products. Videotape, in the hands of the worldwide consumer, has created tremendous new opportunities for bootlegging of their products.

A 'Convention Relating To The Distribution of Program-Carrying Signals Transmitted by Satellite' convened in Brussels, Belgium in May of 1974. The basic purpose of this convention (attended by 40 signatory nations) was to explore how international language could be drafted to "combat piracy of television programs transmitted by satellite". The language of concern should now be familiar to us all:

"Before it became practical to launch satellites for public communications, the constraints of technology to a certain extent protected a broadcaster who originated programming as against other broadcasters who might wish to intercept and re-transmit his programs to a different market. The geographic coverage of signals transmitted through a geostationary satellite is one-third of the earth's surface and it is now possible for ground stations within that vast territory to pick up signals from the satellite and send them on to entirely new and (an) unintended audience without any licensing arrangements whatsoever".

Our concern here is what this group decided, and how therefore the various nations who signed the agreement might feel compelled to enforce their international 'treaty' obligations. As you might suspect the restraints are quite broad as well as very precise. So let's first look at the 'exceptions' since a big portion of the CSD readership is made up of people involved in the engineering, sale and service of satellite receiving terminals.

- 1) Paragraph 75 of the convention relates that if you merely **receive** the transmission of an international satellite (or the signals of a satellite outside of its intended or normal coverage area), **you are not violating the convention.** "Acts consisting merely of reception (or taping) of signals

would not be 'distribution' and would be outside the scope of this convention; especially as testing and experimental reception (or taping) may be necessary from time to time to check the reception equipment as well as the orbital position of the satellite."

For the installer or experimenter or private terminal viewer this apparently clears the way for you to do your thing. At least as far as the **Brussels Convention** is concerned.

- 2) **"The key element** in the concept of distribution is that there must be a **transmission** of program-carrying signals to the general public."

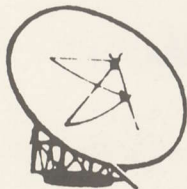
- 3) **"A transmission** would constitute 'distribution' within the meaning of the convention whether it is made simultaneously with the original transmission or from a recording". Of some related interest was the decision "The word transmit does not include the marketing or supply of videotape recordings".

- 4) **"The key factor in determining whether a distribution is to be prevented or permitted is whether or not the signal was intended for the distributor"**. In other words if the recipient-user has the authorization of the sender to utilize the program(s) he has no problems with this international accord.

There were several listed exceptions that may save some readers some grief as well as providing legal ammunition if you are approached by local authorities who do not understand what it is you are doing.

For example, **no copyright violation** occurs if:

- 1) **"Short excerpts of a sporting event or spectacle could be distributed (i.e. re-transmitted) if the genuine purpose was the reporting of a newsworthy event... 'justified by the informative purpose'. To warrant use of a short excerpt under this provision (paragraph 109) the programming must be done as a part of a report of the general news of the day and would therefore normally have to be transmitted from a recording."**



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2)"In paragraph iii the term teaching was amplified to include teaching in the framework of adult education. The delegation of the United States of America suggested that the Conference interpret these terms in a general way to include any kind of 'systematic instructional activities'. At the final sessions it was agreed that the Conference should adopt this interpretation".

Basically then if 'brief' excerpts of news, sporting or other events of 'genuine public interest' are taken from a satellite feed, taped and then later included in a 'report of general news' there is no apparent violation of the Brussels Convention. Furthermore, if the programming extracted from the bird(s) is presented within the framework of 'systematic instructional activities' aimed and devoted to 'educational purposes' it also appears that no violation takes place. And if you are a **private viewer** your reception is not considered a 'transmission' by the Convention and again no violation takes place. Finally, if while installing or testing or checking equipment you wander into a program not intended for you, you are excused.

Beyond that, if you receive **and share**, whether by tape, cable or re-broadcast it would appear you are in violation of the Brussels Copyright Convention of 1974. And for now that is the last (and latest) word in this field. Of the 40 nations who were signators to the Convention either in Brussels or within a year thereafter we have Argentina, Brazil, Canada, Ecuador, France (for itself and many of its dependencies), Guatemala, Mexico, United Kingdom (for itself and those former territories where it still has foreign relation responsibilities) and the United States. If you don't see the country of interest listed here, and that country is in North America, the Caribbean or South America you can assume it was not a signator to the Convention.

Pressures That Bear

Remember many thousands of words ago how the US managed to get the Canadians to back off their plan to use ANIK for international services? The implied threat was that if Canada tried it, the US would refuse to launch ANIK.

That is, in the language of the day, pretty 'heavy' talk. There is of course in the normal day to day conduct of international business affairs many hundreds of opportunities for a nation (such as the US) to put pressure on another nation (such as Venezuela) to get something the US does not like, stopped. Generally speaking the US government exerts such pressures because (1) there is national pride at stake (the ANIK-international proposal for example), or, (2) some pressure group (such as the MPAA) finds a sympathetic ear within the administration or bureaucracy which it convinces to plead its case. National pride reactions come swiftly because everything happens at a high level. Pressure groups take longer to make themselves known and ultimately their efforts may fail for a lack of time or conviction on the part of the government agencies or agents charged with carrying the message.

We have seen that efforts to get **legal permission** to deliver (on contract, for a fee) US domestic bird programs into Canada and Grand Cayman island have failed. They simply ended up in limbo at the FCC because there is no policy available that would allow a bureaucracy to either approve or dis-approve the applications.

As Taylor Howard has repeatedly stated "The technology of the satellite system has rapidly outstripped the legislation created to insure the orderly development of the benefits of technology". Where all of this may lead in the coming year only time will tell.

WHAT'S IN STORE IN WASHINGTON?

No question about it; the low cost TVRO industry is growing

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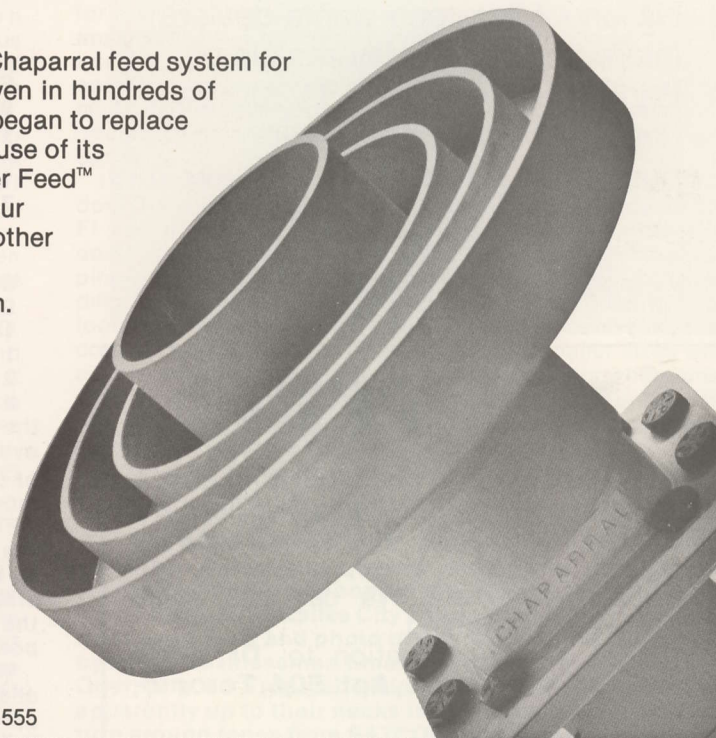
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WASHINGTON SPTS SCHEDULE SHAPES UP

up. In the allocated exhibit hall area there were 55 booths set aside for the display and TVRO equipment. **On March 17 all 55 of those booths were reserved** by suppliers anxious to show their products to attendees and participate in the fifth SPTS event to be held in 20 months. (Those who came in after that date were assigned to an alternate exhibit hall pressed into service when the demand simply exceeded the supply!)

Each attendee at SPTS '81 Washington will receive as a part of his registration package a brand new **'STT Low Power TV Handbook'**. We are very proud of this newest "manual" since it combines into a single printing both the legal and technical aspects of operating a low power (satellite signal fed) television broadcasting station. SPACE General Counsel Rick Brown, who has assisted dozens of applicants to prepare their FCC paperwork for this new service, has teamed up with Cooper and between the two they have put together a

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very 'state of the art' Handbook on not only making application for such a station, but building and operating such a station. Coop's portion details everything from standby powering and video switching to splitting up the translator output signal between horizontal polarization (for local coverage to subscribers) and vertical polarization (for relaying on to the next translator in the network). It also details part by part how you take \$6,300 and build both a TVRO receive terminal and a ten watt VHF translator station. And they said it had to be expensive!!! (For those who won't attend SPTS '81 in Washington, this new 'Handbook' Manual will be available by mail starting in May.)

Now the program proper. Subject to change (we like to keep the program fluid right up to the last minute to allow the participants to be selected on the basis of the very latest in technology and legal experience), here is the way we presently see the Washington Seminar program shaping up:

Friday April 17th -

- 10AM** - SPACE President H. Taylor Howard will update **"The Satellite To Earth Connection"**.
- 11AM** - Coop will moderate a panel discussion entitled **"The Fallout of Technology"** with Congressmen Charles Rose (D, N.C.), Billy Tauzin (D, LA), FCC Commissioner James Quello and engineer-scientist Sruki Switzer.
- 12N** - The **exhibits** will open for a two-hour (preview) period; closing at 2 PM.
- 2 PM** - Technical Session - **TVRO LNA Technology Update**
General Session - The TVRO Distributor Dilemma
- 3PM** - Technical Session - **TVRO Antenna Technology**
General Session - Marketing Of The Product
- 4PM** - Technical Session - **TVRO Receiver Technology**
General Session - Low Power TV System Planning
- 5PM** - **Exhibits** will open until 7:45 PM
- 8PM** - Rick Brown will moderate a panel entitled **"The Promise of Low Power TV"** with I.S. Blonder (Blonder Tongue), Michael Cuzzins (formerly with FCC low power TV group), Parry Teasdale (pioneer low power TV operator), Fritz Attaway (VP of Motion Picture Association of America). This panel will conclude at 10 PM.

Saturday April 18th -

- 9AM** - **Exhibit Halls Open** (until 11:00 AM)
- 11:30** - **Ralph Nader** address - **"The Promise of Every Man's Television"**
- 1PM** - **Exhibit Halls Open** (until 6 PM)
- 7PM** - General Meeting of **SPACE**, everyone invited for update on TVRO legal problems. (This meeting will conclude at 9PM)

Sunday April 19th -

- 9AM** - **Exhibit Halls Open** (until 12 noon)
- 12:30** - The **Programming Permission** Dilemma
- 1:30** - The **New Dealer** Start-up Dilemma
- 2:30** - (Optional) **Exhibit Hall Open** (until 4 PM)

If you are planning to bring a videotape machine to catch the closed circuit replay in your hotel room of past SPTS events, be advised that you will need approximately 30 hours of blank tape. As this is prepared we are up to our necks in more than 100 hours of original videotape from the first four SPTS/SBOC events attempting to provide a cohesive look at the topics (legal, marketing, technical) as they evolved SPTS by SPTS. In this way we hope you will have a clearer understanding of how this industry got to where it is today and what the events of the past have done to shape our present posture.

We have repeatedly suggested that attendees plan to check in Thursday, April 16th. Not only will the 'antenna set-up' and 'aiming' activities be underway all day Thursday (that is a very educational experience if you are new to this

business) but this will give you an opportunity to 'get the lay of the land' so that your seminar three days can be attacked with maximum return to you. SPTS events are very busy. People come to learn and share and there is plenty of opportunity for both. See you in Washington!

Information? There is a registration form in the center of this issue of CSD; or call Rick or Gloria Schneringer at (405)396-2574 now.

PROGRAMMING CORRESPONDENCE

UPDATE ON PROGRAMMING PERMISSION

In April of 1979 I purchased your Satellite Handbook package and since that time I have been hooked on the prospect of receiving satellite TV. During the early part of August 1979 I purchased a 15 foot parabolic antenna and an assortment of surplus microwave equipment. Also during that month I attended the first SPTS (in Oklahoma City) and bought an assortment of four LNA boards from Pioneer Robert Coleman.

During the interim I have not seen a single sparklie of satellite TV but I have hardly given up! Due to a small back yard and the resulting cluttered view of the Clarke orbit belt I decided my 15 foot antenna would have to be mounted on a tower. The basic design of the antenna presented numerous special problems but I have slowly worked them out. And hopefully in the next few weeks I will be able to get started on the electronics part of the project.

Looking to the future I decided it was time to start applying for permission to watch programs being relayed by the various satellites. During the month of November 1980 I applied for permission to receive programs from twenty different companies supplying program material to the satellites. Of those 20, I have heard from 13 firms and have been granted formal permission by 8 of these while being denied permission by 5.

Perhaps of special interest is the letter of refusal from HBO. Unlike letters received by numerous other individuals and companies, this letter is relatively (for HBO) cordial and it seems to indicate that HBO may be in the process of taking a second look at the private terminal market. I was also quite surprised to receive permission from the Cable News Network (CNN); transponder 14, FI) after writing directly to WTBS in Atlanta.

Gary A. Reed
Amarillo, Texas 79110

Since many of Gary's letters were dated in December and early January we can assume his information is about as current as any. For those of you who have not made formal written requests for 'direct satellite viewing permission' from the various programming firms that supply to the satellite(s), here is a run down of those whom Gary found affirmative: (1) Cable News Network,

Patty W. Holland, 1050 Techwood Drive NW, Atlanta, Georgia 30309; (2) Home Theater Network (part of the SPN programming package), Steve Broydrick, 465 Congress Street, Portland, Maine 04101 (note: \$45 per year); (3) C-SPAN, Jana E. Dabrowski, Tower Villas, 3800 N. Fairfax Drive, Arlington, VA 22203; (4) PTL Satellite Network, Linda K. Edwards, Trinity Advertising Agency, 7224 Park Rd., Charlotte, NC 28279; (5) Modern Satellite Network (MSN), Dolores Michael, 5000 Park Street North, St. Petersburg, FL 33709; (6) Trinity Broadcasting Network (TBN-KTBN), Sam Starr, P. O. Box A, Santa Ana, CA 92711; (7) National Christian Network (NCN), Ray Kassiss, 1150 West King Street, Cocoa, Florida 32922; (8) Continental Broadcasting Network (CBN), Scott Hessek, Virginia Beach, VA 23463. The 'current crop' of negative letters came from HBO ("Currently it is HBO's policy to provide its service to cable and MDS retailers only..."), SHOWTIME ("It is the policy of SHOWTIME to provide our services exclusively to licensed cable and MDS operators only..."), USA Network ("Due to Major League contracts that we hold, we are prohibited from contracting our services to you unless you are a licensed CATV company holding a city franchise for the communities that you will be serving..."), SSS/WTBS ("Due to unresolved issues in the US Copyright Law, effective August 14, 1980 SSS discontinued the WTBS channel service offering to private users...") All of this permission business remains very fluid of course and CSD tries to update it several times per year. We were due to do it again and you saved us untold hours of research Gary; thanks for sharing!!!

BELIZE TEMRINAL

I thought you might be interested in a new private terminal operational here in Belize, Central America. This is a commercial Harris antenna, 6 meter in size. I am all set up myself to try a system consisting of an AVCOM receiver, 85 degree LNA and Bob Luly's 15 foot Umbrella antenna. I have everything but the antenna at this writing. The new six meter terminal has installed as a commercial business enterprise by a pair of local business people. They have set up videotaping equipment to tape programs from FI and a newspaper story quotes them as offering 'immediate, same day service' for videotape copies of programs available via satellite. I am anxious to have my own system operational since there is intense interest in satellite TV reception in this country now and if my system works I intend to sell them commercially. It might interest everyone to know that the Harris system now operational cost the buyers \$50,000 (US; \$100,000 Belize currency) installed.

I am very interested in finding a good antenna supplier for down here; I am hopeful that a 15 footer will be adequate on FI and it certainly should be for some of the other US domestic birds. Because of considerable problems with shipping, packaging and importing large antennas are going to be difficult to import. Is it possible that ADM will be offering a 15 foot version of their 'petal' antenna anytime soon? I like the construction and the way it ships but the smaller sizes will simply not work here. For those who may wonder where this country is located, we are just east of the Yucatan area of Mexico on the same peninsula and round trip air (under two hours) from Miami is but \$226 (US).

John Fuller
P. O. Box 109
Belize City, Belize
Central America

Fuller sends along a copy of the January 3 (1981) issue of The Reporter, a Belize City newspaper, which carries a front page story and photo of the new terminal installed by Belize businessmen Emory King and Nestor Vasquez. Operating as Tropical Vision Company, the pair are apparently up to their necks in videotape supplying fast turn around tapes from SATCOM I programs to a hungry

marketplace. Naturally we think the right way to make this run is to tie it to a low power TV transmitter, scrambled to recoup the investment, and make the programs available to thousands rather than a handful who have VCR machines. Belize, like the Turks and Caicos, is in the processing of separating itself from the United Kingdom. Years ago it was called British Honduras. The British hauled Mahogany and other natural things out of the land but put very little back in the process. English is the 'official' language although Spanish is also very common.

ROHNER AGAIN

I too have fallen into the trap of having Rohner and Associates holding my money without filling my orders. I see other complaints published in the January '81 **CSD**. I have contacted the Better Business Bureau (234 Insurance Exchange Bldg., Des Moines, Iowa 50309) to ask for assistance in getting \$695 back from Rohner; money I sent to him early in October for a 'basic' TVRO receiver. I am hopeful that others with problems will also contact the same BBB office as well as the attorney general for the state of Iowa.

Dennis Rizzio
Video Security Systems, Inc.
Armonk, N.Y. 10504

On October 6th we ordered four model SAA-2 satellite audio amp-demodulator kits from John Rohner and sent a check to cover same in the amount of \$60. In November we received our cancelled check back and after four letters to John Rohner asking him to send kits or return money, we have heard nothing either way. I believe this should be brought to the attention of others through **CSD**.

Ed Conrad
944 5th Street
Sparks, NV

While the number of reports of 'problems' with delivery of Rohner & Associates hardware has dropped off sharply they do continue to trickle in. Our attempts to get through to John have also been frustrated by his telephone answering machine or a busy telephone. As previously suggested, 'Caveat Emptor' or buyer beware.

BIRD OPERATIONAL NOTES

Programming notes for system sellers. Odds are better than even that breakthrough in negotiating satellite feed use rights in limited areas for condo and apartment type commercial installations will be made by SPACE at Washington SPTS. Keep your fingers crossed!

Approval of Canadian DBS system featuring 8 12 GHz channels spread over four time zones, sponsored by group of Canadian cable operators and broadcasters, seems likely. Move would establish Canada as leader in 12 GHz DBS

systems, provide major shot in arm for development of hardware for 12 GHz service.

Further indication Canadians will do something, soon, with 12 GHz DBS; US firm General Instruments (of which Jerrold Electronics is a part) agreeing with Canadian satellite hardware pioneering manufacturer SED to take SED line of DBS receiving equipment and to put it into 'mass production' as soon as possible. Initial GI production will be at Ontario plants.

Meanwhile FCC is to consider COMSAT DBS application April 21st; immediately following **SPTS** confab in Washington April 17-19th. If you can stick around for a few days it would be worth your while to attend session.

CBS continues to argue that DBS approval by FCC will cause harm to scheduled 1983 international conference deliberations of DBS issue and in-space allocations. CBS recently demonstrated trio of high resolution (1,000 line up pictures) transmission systems which they would like approved for 12 GHz DBS services.

Trinity Broadcasting currently giving away SA 4.6 meter earth terminals to first 50 cable firms that agree to put Trinity on dedicated cable channel full time. System is free to use 'gift' dish for other services on COMSTAR D2 as long as Trinity gets full carriage.

Follow up to this month's report on US DOMSATs providing service to non-US territory. AT&T asking FCC for permission to put in link between mainland USA and American base in Cuba at Guantanamo Bay for two-way communications. Service if approved will be on D2 initially, shift to D3 this fall. Unannounced is **present** delivery to Guantanamo Bay of US TV programming via satellite already; officially denied of course.

COMSTAR D4 apparently will commence service from 127 degrees late this month. Bird went into orbit February 24th. Will take over considerable service load from other COMSTAR birds and D1 (now at 128) will move over with D2 (at 95) in a shared operation.

WESTERN UNION, not to be outdone by RCA, has asked FCC for permission to build sixth WESTAR (24 channel) bird. Numbers 4 and 5 are scheduled for 1982 launch.

DBS no longer being fought vigorously in Europe; some nations had fought concept in past 18 months, worried about 'spill over' between nations. Now most accept reality that by 1983 there will be first DBS service there and so game of finding partners to share costs has begun. Latest to consider it - a Swiss group planning a 3 channel international service for most of Europe proper.

12 GHz SBS service officially went into operation in March; Boeing facility in Virginia on receiving end of transmissions originating in Washington (state).

More details of TIME, INC. plan to provide Teletext service. Plan appears to be to provide colorful mixture of text and graphics on HBO transponder on RCA F4 bird. Home viewers, interconnected through cable, will have box to select data sources by subject title. Late 1981/early 1982 start date.

Warner Amex plans for F1 transponder 11 unveiled. Firm will debut 24 hour per day 'Music Channel' August first. Each hour will feature around 9 musical numbers by major and 'up and coming' musical groups; sort of 'Juke Box of the Air' interspersed with interviews, 'music-graphics' and commercial messages. No charge for service.

Playboy programming featuring nude center fold gals and other 'stimulating adult activities' likely on satellite within 12 months. Playboy's new 'cable division' working out final format now.

After years of fighting with unreliable microwave link between downtown Chicago and Lake Geneva (WI) RCA uplink site, United Video is building their own uplink for WGN/WFMT and others, just outside of Chicago. Existing link is subject to frequent problems, has checkered history including being subject of law suit in past for poor performance. Scheduled turn on date is mid-summer of this year.



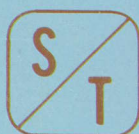
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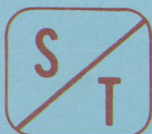
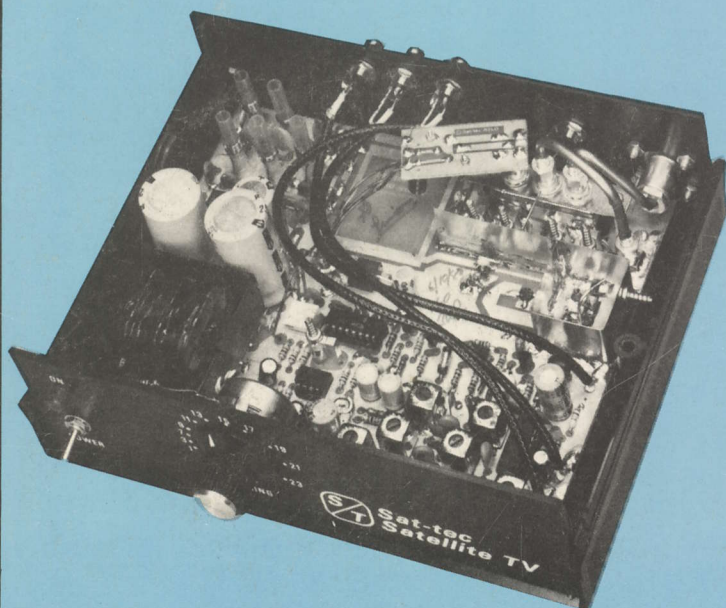
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